THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXVII. No. 666.] LONDON, FEBRUARY 15, 1876. [28TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL
COAL. Analysis—10,000 cubic feet of gas per ton of coal; 26-candle gas; 13¼ cwt. coke per ton of coal.
The London Exhibition in 1851 was lighted with gas made from Ramsay's Cannel.
RAMSAY'S PATENT CONDENSED COKE.
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GAS-RETORTS, introduced 1828. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.
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They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations.
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THE ALMA WORKS, WALSALL.
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J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water; Gun-Metal Cocks, Stocks, and Dies; Galvanized Tubes and High-Pressure Tubes, &c.
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Also, STATION-METERS, PRESSURE-GAUGES, STREET-LAMPS, REGULATORS, &c.
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IMPROVED DRY GAS-METERS,
WARRANTED TO MEASURE CORRECTLY, AND NOT TO VARY.

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SILVER MEDAL, PARIS EXHIBITION, 1867.

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OF THE

FRICTIONLESS DRY GAS-METERS,

Beg to intimate to Gas Companies and others that they are now prepared to supply these very superior Meters at the same prices as for the ordinary Gas-Meters.

In the construction of this Meter, for which the best tin plates only are used, every mechanical contrivance has been taken advantage of successfully to reduce the friction to a minimum, which is amply proved by the fact that they are made to work upon only one-fortieth of an inch pressure. By an improvement also in their construction, a steadier light is obtained, and greater capacity than can be got from any other Meter in the market. No gas can pass under the valves on any back pressure, as is the case with many other Dry Meters.

To Gas Companies supplying gas through streets with heavy gradients, these Meters are invaluable, as much gas is saved from the low pressure required to work them.

ALL METERS ARE UPHELD FOR FIVE YEARS.

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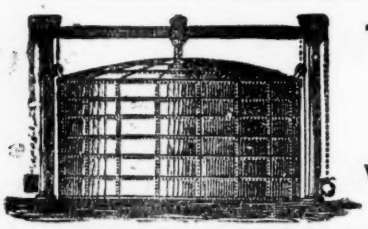

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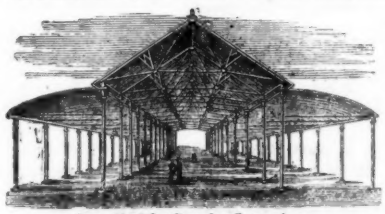

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BUILDINGS, AND SHEDDING,

For which Estimates will be given on application,

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PREPARED TO PLAN FOR ERECTION ABROAD,

EITHER WITH

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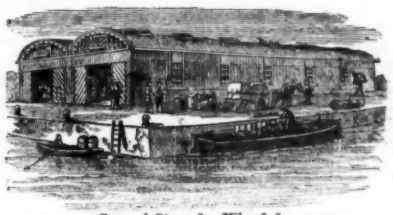

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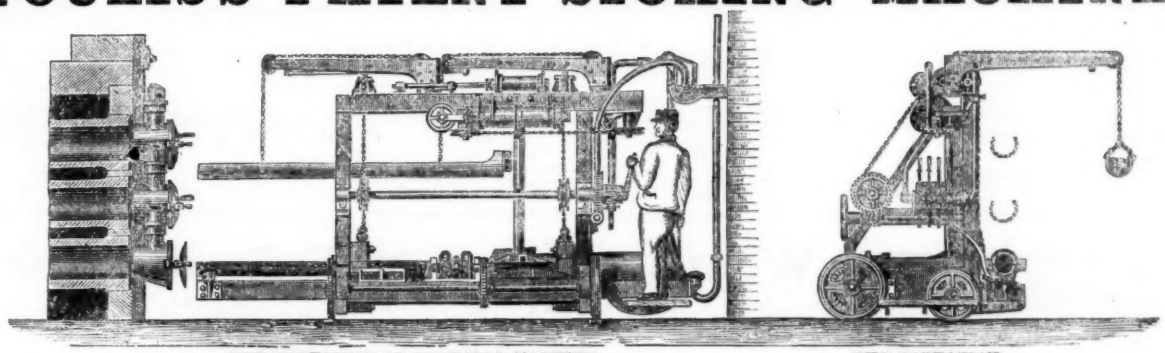
LONDON OFFICE: 1, DELAHAY STREET (First door out of Great George Street), WESTMINSTER, S.W.

FOULIS'S PATENT STOKING MACHINE.



SIDE ELEVATION OF CHARGING MACHINE. END ELEVATION.

(The Drawing Machine will be Illustrated in next week's Advertisement.)

Makers: TANGYE BROTHERS and HOLMAN, London and Birmingham; ADAM WOODWARD and SON, Manchester; ROBERT LAIDLAW and SON, Glasgow; MASCHINENBAU-ACTIEN-GESELLSCHAFT HUMBOLDT, Kalk bei Deutz;

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GAS ENGINEERS,

WORKS: COMMERCIAL ROAD, EXETER,

INVITE THE ATTENTION OF GAS COMPANIES AND OTHERS FOR THE SUPPLY OF

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NEW GAS-WORKS erected complete. Plans and Estimates furnished. MAINS, METERS, SERVICES, LAMPS, &c., adapted for Towns of any size. Gas Companies advised on Improvements, Extensions, and Alterations of Works.

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RETORTS and RETORT-HOUSE FITTINGS, CONDENSERS, SCRUBBERS, ENGINES and EXHAUSTERS, PURIFIERS, STATION-METERS, GOVERNORS, VALVES, &c.

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They beg special attention to the excellence and superiority of their WET and DRY METERS, several thousand being now in use by many of the largest Gas Companies in the West of England and South Wales. Warranted to measure correctly, and not to vary. Their acknowledged superiority has brought them into general use more rapidly than any Meters hitherto manufactured. A guarantee of Five years tendered with each Meter.

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PATTERN-BOOKS and PRICE LISTS furnished.

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THE

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LIMITED,

KING'S ROAD, LONDON, N.W.,

OFFICE: 115, VICTORIA STREET, WESTMINSTER, S.W.,

MANUFACTURERS OF

"WET" & "DRY" GAS-METERS IN IRON & TIN-PLATE CASES,

STATION-METERS AND GOVERNORS, STREET-LAMP METERS, BOXES, AND REGULATORS FOR THE AVERAGE METER SYSTEM.

TO GAS COMPANIES, ENGINEERS, &c.

These Works are in full operation, and it will be the aim of the New Company not only to keep up the excellent workmanship of their predecessors, but, by the introduction of special machinery, to manufacture **Meters of a higher standard than is usually given, without increasing the cost.**

Special attention is invited to the Compensating Wet Gas-Meter of De Castro and Burton, which is now becoming so generally adopted, and is more simple in construction than any other Compensating or Ordinary Wet Meter. There is but one centre of friction to be overcome by the gas. By its self-adjusting principle it maintains an unvarying water-line; and the reservoir contains sufficient water to supply the Meter for twelve months without attention. It is unaffected by "tilting," and cannot be "flooded" by any pressure.

The Company also manufacture Dry Meters upon the most improved principle, and all their Meters being made to standard gauges, the most accurate measurement is obtained.

Attention is also called to their Dry Meters in Wood Cases, as used by some of the London Gas Companies. These Cases are a great preservation to Tin-plate Meters, especially in seaport towns, where the air is impregnated with salt; they are also particularly suited for export.

The Company repair or convert every description of Wet Gas-Meters to De Castro and Burton's Patent.

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WELLINGTON TUBE-WORKS, TIPTON, STAFFORDSHIRE,

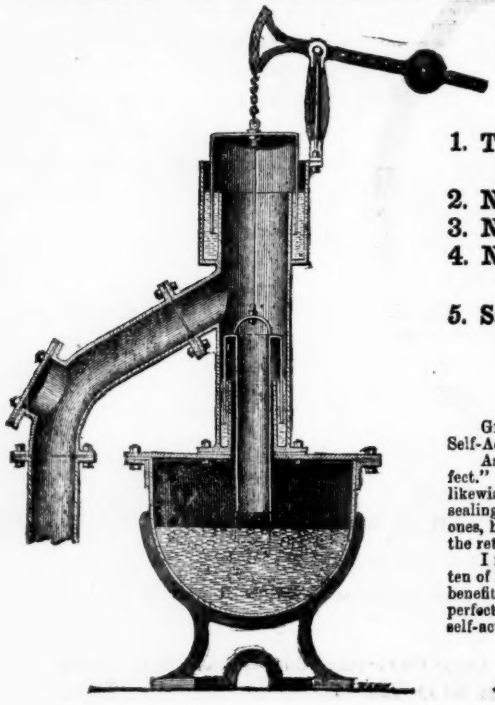
MANUFACTURER OF

EVERY DESCRIPTION OF TUBING, GAS, STEAM, HYDRAULIC TUBES AND FITTINGS,
EITHER BLACK, GALVANIZED, OR ENAMELLED HOT WATER TUBES AND FITTINGS,
CORE BARS, COILS, COCKS (IRON OR BRASS),
CHANDELIERS, &c., GAS-FITTERS' TOOLS, GAS TONGS, STOCKS, TAPS, DIES, &c., &c.,
HANDRAIL TUBINGS, IRON AND BRASS, PLAIN OR TWISTED,
TELEGRAPH TUBES OR POLES, &c., &c.

SELF-ACTING REMOVABLE DIP-PIPE,

PATENTED BY

CHANDLER & STEVENSON.



ADVANTAGES.

1. There is no pressure on the Retorts.
2. No deposit of Carbon.
3. No scurfing is required.
4. Never a choked Ascension-Pipe.
5. Saves Fuel and Wear and Tear.
6. Gets 10 per cent. more Gas out of the Coal, and a higher Illuminating Power.
7. Is never out of order.
8. Requires no attention.
9. Is perfectly automatic in its action.

TESTIMONIAL.

Metropolitan District Asylum, Caterham, Surrey, Dec. 14, 1874.

MESSRS. CHANDLER AND STEVENSON.

GENTLEMEN,—I have much pleasure in bearing testimony to the complete working of your "Patent Self-Acting Dip-Pipes," which have now been in constant operation over three months.

As regards the action of the apparatus, I can describe it no better than by calling it "simply perfect." Immediately the retort is charged and the lid secured, the small holder rises, which lifts the Dip; likewise the instant the gas is permitted to escape at the mouthpiece the holder falls, thus perfectly sealing the Dip. I am fully convinced of the superiority of these Self-Acting Dips over Non Self-Acting ones, having experienced the fact that stokers do occasionally neglect to unseal the Dip after charging the retort, thereby causing a waste or loss.

I feel that it is quite unnecessary for me to say more on the subject, excepting that, having had ten of Messrs. Chandler's Dip-Pipes in use more than one year, and having experienced the great benefits derived thereby, inasmuch as the yield of gas from the coal is greatly increased, and the retorts perfectly free from carbon and other advantages, and seeing that the same Dip has been made perfectly self-acting by the second patent, I feel convinced that this is the right thing.—Yours obediently,

W. CRICKMAY, Resident Engineer.

For terms of use and cost, apply to Mr. G. W. STEVENSON,

4, WESTMINSTER CHAMBERS, VICTORIA STREET, S.W.

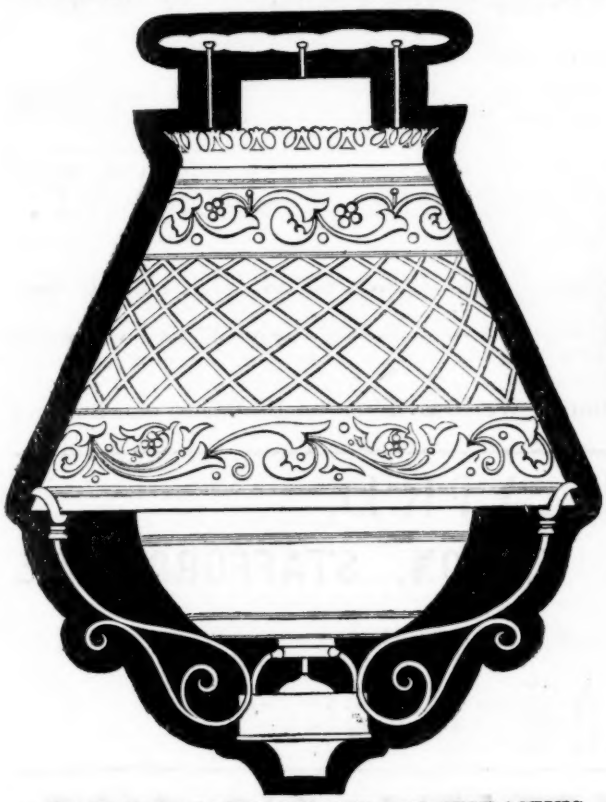
WILLIAM SUGG,

GAS ENGINEER,

VINCENT WORKS, VINCENT STREET,

WESTMINSTER, S.W.

WILLIAM SUGG'S LATEST IMPROVEMENTS IN GAS-BURNERS.



The "LONDON" ARGAND BURNER, with SELF-ACTING GOVERNOR (Patent).

"Westminster" Pattern Shade, as used in the Ministers Rooms and Lobbies of the Houses of Parliament. This Burner is No. D size, and, with a consumption of 5 cubic feet per hour, gives about 2 candles more light than the Gas Referees model, called the No. 1 "London" Argand Burner.

With 5 cubic feet per hour of gas, which gives a light equal to 14·3 parliamentary sperm candles (as tested by the Sugg-Letheby Standard Burner), the ordinary Argands give only a light equal to 10 sperm candles, while the No. F Patent "London" Argand Burner gives a light equal to 18½ sperm candles, or 85 per cent. more light for the same quantity of gas consumed.

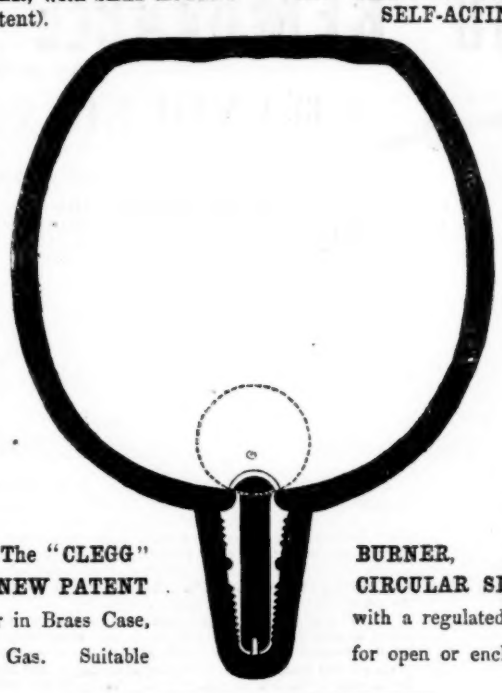
The "CHRISTIANIA" FLAT-FLAME BURNER, with SELF-ACTING GOVERNOR (Patent).

This Burner has been pronounced by the most eminent Engineers of the day to be the perfection of a flat-flame Burner.

The Shades, which are made in a beautiful white glass called Albatrine, are manufactured *exclusively* for these Burners, and cannot be obtained elsewhere.

The light emitted from this Burner is very white and soft to the eyes, and is about 30 PER CENT. superior to the ordinary fishtail.

Numerous other pattern Shades, Plain or Ornamental, may be obtained with these Burners.



The "CLEGG" BURNER, with the NEW PATENT CIRCULAR SLIT,

Is a flat-flame Burner in Brass Case, with a regulated opening for the admission of Gas. Suitable for open or enclosed Lights.

Price Lists and Prospectuses, with description of all the "London" Argand and other Burners, and their proper Shades, Supports, &c., forwarded post free on application.

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MANUFACTURERS OF

IMPROVED CENTRE-VALVES,

PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.

WEST'S GAS-IMPROVEMENT COMPANY, LIMITED,

ARE NOW PREPARED TO SUPPLY AND ERECT THEIR PATENTED MACHINERY FOR

CHARGING AND DRAWING GAS-RETORTS,

And to enter into arrangements with GAS COMPANIES for its use upon moderate terms of Royalty.

The Patented Machinery has secured the approbation of all Engineers who have visited the MAIDSTONE GAS-WORKS, *where it is in full operation, and may be inspected at any time on application to the Manager.*

The advantages attending its use are—

INCREASED VOLUME OF GAS PER TON.—INCREASED YIELD PER RETORT.—INCREASED BULK OF COKE FOR SALE.—REDUCTION IN LABOUR AND LESS DEPENDENCE ON SKILLED STOKERS.

A Pamphlet containing a description of the Machinery, and Copies of Reports on the working of the same, &c., will be forwarded on application to the MANAGING DIRECTOR, Maidstone. Communications may also be addressed to the Consulting Engineer, R. P. SPICE, Esq., M. Inst. C.E., 21, Parliament Street, London, S.W., or to the Engineer and Analyst, F. W. HARTLEY, Esq., A. Inst. C.E., 55, Millbank Street, London, S.W.

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SIZES: ¾ to 12 inches at GLASGOW.

„ 1½ to 7 „ STOCKTON.

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Freight to London, in the Stream, 10s. per ton from Stockton; 12s. 6d. from Glasgow.

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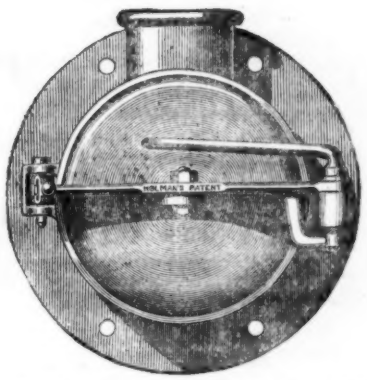
SOLE MAKERS OF

MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

HOLMAN'S NEW PATENT BRACKETED CROSS-BARS,

Anti-Friction Catches and Eccentric Fastenings.



INSTANTANEOUS SEALING EFFECTED.
NO LUTING. NO DUPLICATE LIDS REQUIRED.
HOLMAN'S NEW SELF-SUSTAINING CROSS-BAR ENSURES FREEDOM OF JOINT AND MAINTAINS PARALLEL POSITION OF THE LIDS.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested (rigid cast iron is now successfully employed), nearly 20,000 being in use at various Gas-Works in London and the Provinces, among which may be mentioned:—

The Gaslight Co., Beckton (where, by the end of 1875, nearly 4000 will be in use).
" Gaslight Co., Bow Common.
" Gaslight Co., Silvertown.
" Gaslight Co., Lupus Street.
" London Gaslight Co.
" Independent do.
" Phœnix do.
" South Metropolitan Gaslight Co.
" Commercial do.
" Imperial do.
" West Ham Gas Co.
" Gas-Works, Barnet.

The Gas-Works, Royal Arsenal, [Woolwich.
" do. Lower Sydenham.
" do. Brentford.
" Consumers Gas Co., Woolwich.
" Alliance and Dublin Gas-Works.
" Edinburgh do.
" Manchester Corporation do.
" Salford do. do.
" Rochdale do. do.
" Liverpool Gas-Works.
" Birmingham do.
" Birkenhead do.
" Nottingham do.

The Newcastle-on-Tyne Gas-Works.
" Lurgan do.
" Carmarthen Gas-Works.
" Merthyr Tydfil do.
" Windsor do.
" Leeds do.
" St. Albans do.
" Over Darwen do.
" Rotherham do.
" Aylesbury do.
" Bournemouth do.
" Ystrad do.
" Cardiff do.
" Rochester do.

The Keighley Gas-Works.
" Aberdare do.
" Ballymena do.
" Richmond do.
" Stalybridge do.
" Longton do.
" Exeter do.
" Ross do.
" Falmouth do.
" Barrow-in-Furness do.
" Belfast do.
" Wakefield do.
And other Provincial and Foreign Gas-Works.

IMPORTANT TESTIMONIAL.

The Gaslight and Coke Company (Commonly called the Chartered Gas Company), Beckton, North Woolwich, July 2, 1874.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—In answer to your inquiry respecting the Self-Sealing Lids, I beg to say that they continue to work well, and I have every reason to be satisfied with them.

I should be very sorry to return to the old system of Luting, and our stokers here freely acknowledge the benefit to them of the new system.

I am, yours truly,
(Signed) G. C. TREWBY.

VIENNA EXHIBITION, 1873.—The highest prize and only Medal "for Progress" for Direct-Acting Steam Pumps for general purposes was awarded to TANGYE BROTHERS AND HOLMAN, Engineers, London, for

THE "SPECIAL" DIRECT-ACTING STEAM PUMPS.

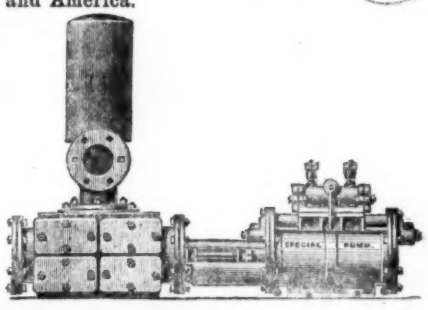
Upwards of 12,000 have been sold in England and America.

In use in upwards of a Hundred Gas-Works in the United Kingdom for Pumping Ammoniacal Liquor, Water, or Tar.

Intending Purchasers are particularly requested to observe the great length of stroke of these Pumps, as compared with the short stroke of Pumps of other makers, as the durability of the machine greatly depends upon this.

The following sizes are those usually supplied to Gas-Works. Those marked, * being usually selected for pumping Tar and Liquor, are nearly always in stock, fitted up expressly with Pump details in iron, and extra length distance-piece between steam and pump cylinders, at a small extra cost.

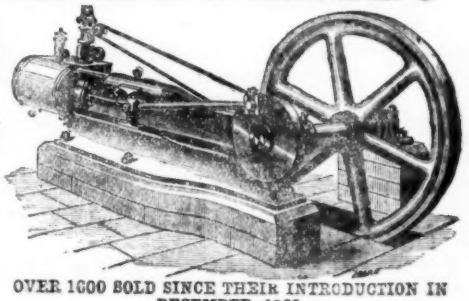
Diameter of Steam Cylinder . in.	3	*4	*5	*6	5	*7	6	*8	7	*10	10
Diameter of Water Cylinder . „	1½	2	3	4	5	5	6	6	7	7	8
Length of Stroke . . . . „	9	9	12	12	12	12	12	12	12	12	18
Gallons per hour approximate .	450	815	1830	3250	5070	5070	7330	7330	9750	9750	13000
REDUCED PRICES. . . .	**£16**	**£18**	**£22 10**	**£30**	**£27 10**	**£40**	**£40**	**£50**	**£50**	**£65**	**£75**



TANGYE'S HORIZONTAL HIGH-PRESSURE EXPANSIVE STEAM-ENGINES.

In designing this Engine the utmost regard has been paid to simplicity of arrangement, strength of construction, and economy in cost. The working parts are considerably reduced in number, as compared with Horizontal Engines generally, rendering it far more durable and compact, the bed-plate, front cylinder cover, guides, and plummer-block for crank-shaft bearing being all cast in one piece, which in design and proportions is admitted by competent engineers to be perfect, and to afford a strength and rigidity that cannot possibly be attained in the best fitted engines of the ordinary horizontal type. The extraordinary stiffness of this Engine will permit of its being driven at a much greater maximum speed than engines generally, and with far less wear and tear. The cylinder with its valve-chest is bolted to the end of the bed. The cross-head slippers and connecting-rod ends are made adjustable, so that any wear can be readily taken up. The fly-wheel, cylinder-end, connecting-rod, and crank-plate, are all bright. All the parts are made to Whitworth's Gauges, and the material and workmanship are of the highest class throughout.

The Governor is of a very special description, and combines in the small space usually occupied by the ordinary steam stop-valve, a governor, throttle-valve, and stop-valve complete. It is exceedingly sensitive, simple, and compact.



These Engines are adopted in Gas-Works at Greenwich (Phœnix Gas Co.), Haggerston (Independent Gas Co.), Nine Elms (London Gas Co.), Falmouth, Harrow, Jersey, Plymouth, Richmond, Rochdale, Santiago (Chili), &c.

OVER 1600 SOLD SINCE THEIR INTRODUCTION IN DECEMBER, 1869.

London 1851. New York, 1853 Paris, 1855. London, 1862.

Dublin, 1865

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS,

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON & CO.,

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

MANUFACTURERS OF PATENT

WET & DRY GAS-METERS,

STATION-METERS WITH PLANED JOINTS,

GOVERNORS, PRESSURE REGISTERS, GAUGES,

AND EXPERIMENTAL APPARATUS,

STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

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THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, FEBRUARY 15, 1876.

Circular to Gas Companies.

No time has been lost in bringing in the Bill for Regulating the Supply of Gas in the Metropolis, the Bill having been introduced, and read a first time, on the second night of the session. It is impossible to say with how much celerity its further progress may be made. The number of measures introduced, and of motions on the paper for discussion, is, for this early period of the session, unprecedentedly large; and some of these are of vast deal more importance than this Metropolitan Gas Question. We may, then, have to wait some time for the second reading of the Bill, on which occasion we shall probably learn what are the views of the Government respecting the measure.

We gather from the remarks of Sir James Hogg, at the last meeting of the Metropolitan Board of Works, that the Bill now introduced, is exactly the same as that settled before the Select Committee last session. But we know that this Bill does not represent the latest views of the Government, nor, indeed, embody the wishes of one, at least, of our local authorities.

We are now pretty well acquainted with the opinions of a majority of the companies, so far as regards the sliding scale, which is the essential part of the Regulations Bill of last session. The amalgamated Commercial and Ratcliff Companies at once accepted it. The Chartered Company, the prime movers in the amalgamations now under consideration, have expressed a willingness to accept it, with some conditions as to the initial price and reserve-fund. The South Metropolitan Company are naturally most anxious for the sliding scale, with the initial price of 3s. 9d. per 1000 feet. The London, Phœnix, and Surrey Consumers Companies have not yet spoken, so we may assume that they are content with the dividends now allowed them, and only wish to be let alone in the enjoyment of their rights.

Thus, the Regulations Bill, as it stands, must encounter some opposition this year, but of what kind it is not easy to predict The companies were not quite unanimous last session; they are very far from being so this year. If the three we have named, who do not originate legislation, and do not wish to be legislated for, will exert a consistent opposition, and, taking their stand upon existing legislation, contend that they have done nothing to forfeit the rights conferred upon them by Parliament, while they are, and have been, anxious and willing to fulfil all the obligations imposed on them, we think it quite possible that they may gain the ear of a second select committee, and, if not prevent, successfully modify, new legislation. They must, however, make up their minds what they will ask for. Simple obstructiveness will not answer. The case was lost last year for the want of agreement among the companies.

We shall now, however, have to face an entirely new proposition, so far as the Metropolitan Gas Companies are concerned, and that is, the proposal to compel the sale of all newly-issued shares by public auction to the highest bidder, with the usual appropriation of the premiums realized. In what way this proposition will be brought forward, we are not yet able to say. Whether the Chancellor of the Exchequer will announce it as a sort of Government *ultimatum* at the second reading of the measure now before the House of Commons, or whether it will be suggested in another letter from the Board of Trade to a select committee, we cannot tell. In some shape or other, however, we are certain that it will be put before the companies. They have, we think, ample time in which they can decide whether, or not, they will agree with the proposition, and, for the present, we leave it for their consideration.

Since penning our last "Circular," we have had the opportunity of conversing with a leading sharebroker, and also with some large holders of gas shares, and we gather from both sources that, the hitherto possessed right of participating in fresh issues of capital at par, has had a considerable influence on the price paid for shares. So far, then, we were wrong. As regards the position of original shareholders, if auction clauses be adopted in the new Metropolitan Gas Legislation, we publish to-day a letter from Mr. G. W. Stevenson, in which he seeks to show that, the creation of a large amount of capital, not entitled to dividend, will add greatly to the security of the investments of existing proprietors. We shall not dispute the position, but may still inquire, how far the additional security compensates for an inevitable loss. We assume, of course, that the dividends are safe, as they, no doubt, will be for some years to come, perhaps for as long a time as the Metropolitan Gas Companies may be expected to exist. It is clear, then, to our minds, that gas proprietors do not require additional security; but what they wish for, and what they are entitled to, as the law stands, is a participation in the issues of new shares. We have said, however, that if the auction clauses will only bring peace, shareholders might be content to waive their undoubted rights. But will they bring peace? They did not do so at Nottingham, where the Corporation were never satisfied until they acquired the undertaking. Nor have they done so at Swansea.

We can then only regard the introduction of auction clauses as a temporary measure, the precise result of which it is difficult to foresee. If share capital at ten per cent. be allowed, no doubt the premiums realized will be considerable, but, in our opinion, certainly not equal to the amount speculated upon by Mr. Stevenson, who professes to imagine that investors will be content with from four to four and a half per cent. It will be remembered that the Chartered Company failed almost completely in raising money from their shareholders at four per cent., and the Imperial experienced some difficulty in getting their seven per cent. shares taken up. And, this being the case, we believe that, the premiums realized on new shares will not exceed those now commanded in the market by old

issues. If shares of £10 each, entitled to ten per cent., be created, they may fetch from £18 to £19. If only seven per cent. be allowed—and, no doubt, Lord Redesdale will see to this—the premiums realized will be comparatively insignificant; only sufficient, in fact, to incite directors to make extravagant issues of new capital. Perhaps, indeed, no greater stimulus to extravagant issues of capital, and extravagant unproductive expenditure, could be found, than these auction clauses would prove. True, as Mr. Stevenson puts it, existing shareholders would not be much benefited by the expenditure; but the simple desire to dilute the dividend-bearing capital as fast as possible, might promote the very mischief it is desired to prevent.

Mr. Stevenson admits that ten or twelve years must elapse, before the dilution of capital will reduce the average dividends "to six or seven per cent., instead of ten per cent." As a matter of fact, the average dividends of the metropolitan gas companies are now only about eight and a quarter per cent. Who, however, can predict what will happen in the course of the next ten or twelve years? London may, in the meantime, acquire some ort of municipal government, and, in that event, as we have often said, the gas companies inevitably disappear. Would the adoption of the auction clauses to-day cheapen the purchase ten or twelve years hence? We believe not.

Mr. Stevenson seems to think that, if shares be put up in small lots, the general public will freely compete for them. We have our doubts. At all events, we could not recommend the public to invest in a risky business—and, having regard to a possible, and probable, future, gas manufacture must be considered a risky business—at four or four and a half per cent. The investment would be not much better than in Consols or Metropolitan Stock, which may be deemed quite secure. We intended to say something of the possible operation of the auction clauses, if enacted in conjunction with the upward and downward sliding scale of dividend; but we shall defer any remarks on this matter until another opportunity.

The Regulations Bill, as its stands, will, this year, have to encounter more or less opposition from some of the metropolitan local authorities. What shape it may ultimately take, we do not, as yet, see; but it seems clear that a uniform initial price is not to the taste of all parties.

The name of Sir Andrew Lusk is on the back of the Regulations Bill, and if he should live, as we hope he will, it will probably be found on the back of a Purchase Bill. Sir Andrew is Scotch to the backbone, and, no doubt, well understands the mode in which most Scottish Corporate gas undertakings are managed. The system in that country of shrewd and honest business men, is to charge consumers for gas, and gas only, and not to make them pay rates for those who, for whatever reason, choose to burn tallow-dips, or petroleum. If a Town-Hall be required in a Scottish burgh, the Council tax the general ratepayers accordingly, and do not, like some English Corporations, keep gas at an exorbitant price to pay the cost. What a palace the Metropolitan Board of Works would have, if they could only get hold of the gas profits! The new Town Hall at Manchester, which will, perhaps, cost over a million, would be insignificant and cheap in comparison.

Sir Windham Anstruther has reintroduced his Burghs (Scotland) Gas Supply Bill, with some amendments, proposed by the Glasgow Corporation Gas Commissioners. What these are we shall not know until we see the printed Bill. In the meantime, we note that the Corporation of Glasgow have resolved to keep a watchful eye on the progress of the measure.

We understand that an appeal is to be made against the decision of Vice-Chancellor Bacon, in the case of *Patterson v. The Gaslight and Coke Company*, and, therefore, we are, at present, restrained from making any further comment on the case. The necessity for the appeal is to be deplored on several grounds; but we cannot help thinking that the company are justified in their proceedings.

We have received a letter from Mr. Patterson's solicitors, demanding the withdrawal of, and an apology for, the remarks made on this case in our last number. Our offence seems to consist in the use of the word "alleged" in reference to Mr. Patterson's invention. In reply to this communication, we can only say, that while loyally respecting the judgment of the learned Vice-Chancellor, and far from desiring to make a remark which could be construed injuriously to the plaintiff, we do not see that in the use of the term objected to, we were guilty of any indiscretion, as it was evident, in a case of this importance, the defendants would not rest satisfied with the decree of a Court of First Instance, and that, therefore, the novelty of the invention cannot yet be said to be fully substantiated.

At the last meeting of the Town Council of Liverpool, Dr. Cross, the chairman of the Gas Committee of the Corporation, moved a resolution that Mr. Young, of the firm of Turquand, Young, and Co., London, be recommended to the Recorder, as auditor of the accounts of the Liverpool Gas Company, according to the provisions of the 35th section of the Gas-Works Clauses Act, 1847. A leading member of the Corporation is the auditor of the gas company, but some members are not satisfied with his examinations of the accounts. A suspicion seems to be abroad that the company spend large sums out of revenue which ought to be charged to capital account; indeed, so much seems to be admitted by the auditor of the company; but it was not shown that such expenditure was disadvantageous to the consumer. For our own parts, we cannot, for a moment, believe that anything can be seriously wrong in the accounts of the Liverpool United Gas Company, and we have no doubt that they would afford any auditor, legally appointed, every opportunity for a thorough investigation of their accounts. The action of the Gas Committee of the Corporation is, however, so hostile, that the Company are fully justified in raising every obstacle possible. In the end, Dr. Cross's motion was shelved for a time, principally, it would seem, because the proposal to recommend a London accountant was considered a reflection on the accountants of Liverpool. The somewhat underhand proceedings of the Gas Committee were justified by Dr. Cross, who remarked that, "when fighting "a gigantic monopoly, like the gas company, it was only by "attacking them in secret that they could be successfully com-"bated." For our own parts, we never knew any good to come of secret warfare, but none in this case is possible. Let the Corporation take proceedings under the section of the Gas-Works Clauses Act they mention, and see what will come of it. The Recorder and Chairman of the Quarter Sessions of Liverpool happens to be standing counsel to the gas company, and therefore an opportunity was afforded to fling dirt, a chance which the West Derby Local Board appreciated. It is clear, however, that the two authorities cannot act in concert, except in dirt-throwing. They are now hopelessly at issue on the water question, and whenever the Corporation of Liverpool attempt to get hold of the gas supply, we may be certain that the West Derby Board will put in a strong claim to be possessed of a portion of the undertaking. We do not think the United Company need be uneasy at these hostile demonstrations.

The Town Council of Southampton have resolved, by a necessary majority, to oppose the preamble of the Bill of the gas company, and now only the consent of a ratepayers meeting is required to justify what may prove to be a large and useless expenditure of public money. The bugbear appears to be the proposal of the company to raise £100,000 of new capital. No one in the Council—not even the Town-Clerk—had the sense to explain that the company do not propose to raise all this money at once, and that gas companies, as a rule, propose in their Bills only so much capital as, issued at intervals, will suffice for necessary extensions during the next ten or twelve years. The Town-Clerk of Southampton is evidently a genius. The company ask for power to issue debenture stock, though for what purpose that Town-Clerk does not know. He evidently pays little attention to gas affairs, or he would have seen that in the interest of consumers it has been insisted that companies should raise money by borrowing rather than by the issue of share capital. We shall not notice other absurdities uttered at the meeting, for we have little doubt that the opposition to the company will presently collapse.

The shareholders of the Isle of Thanet Gas Company, at a recent meeting, unanimously approved the proceedings of their directors, in opposition to the Ramsgate Local Board. The Board, it was mentioned, had as yet made no legal offer of purchase; and as regards terms, it was remarked that, the value of the pipes and mains, was greater than the sum talked of by the Local Board, as sufficient to pay for the whole works, to say nothing of the premium for a compulsory purchase.

The Local Board of Sevenoaks have advertised the terms on which they will withdraw from all opposition to the Bill of the gas company. These are, (1) that the company will undertake to give gas of the illuminating power required by the Cray's Gas Act, 1865, such illuminating power to be tested by the burner deposited with the Board of Trade; and, (2) if the company agree, the Local Board will, at their own expense, provide and maintain a testing-place, with all necessary apparatus, situated at a distance of not less than 500, nor more than 1000, yards from the works. We hope the company will accept the terms. The Cray's Act requires the supply of fourteen-candle gas, tested by the old burner, which is equivalent to sixteen-candle gas, tested by Sugg's new "London," as proposed by the Local Board. This quality is unusually high for a town like Sevenoaks. Most provincial towns are now content with fourteen-candle gas, tested by the same burner. However, as the price agreed to is not bad, and as the Board exhibit great liberality in the matter of a testing-place, and since it is as advisable for the company, as the Board, to avoid parliamentary expenses, we think the company may afford to concede the illuminating power. The Local Board, however, must be cautioned that they will have to pay

for it. They must not expect to have sixteen-candle gas, in the Sevenoaks district, at London prices.

The Chester Gas Company have reduced the price of gas threepence per 1000. We do not, in this instance, mind falling in with the humour of a local journal, and reporting that the directors, having a surplus, after paying maximum dividends, saw it fit that the public should share the advantage.

Negotiations of a friendly character have been commenced by the Corporation of Warrington and the Gas Company, for the sale and transfer of the undertaking. No complaints are alleged against the company. It is the old familiar story: the Corporation expect that if they get the gas-works they will be able to reduce the rates, and light the town a great deal better. They will, no doubt, get the works, and, by-and-by, we shall see the result.

The Halifax Corporation have, at last, come to the conclusion that they have too much capital employed in the gas undertaking, and they have decided to reduce the amount by £35,000, at the rate of not less than £3000 a year. They have begun by applying the whole of the surplus profits of the past year (£4500) to the purpose. A question has arisen, however, as to whether such an appropriation of surplus profits is legal, and the ultimate decision on the matter has been postponed.

We may sympathize with the somewhat ancient Corporation of Beverley, in being compelled to apply to the Central Authority, for permission to borrow the beggarly sum of £3000 for the extension of their gas-works. The Corporation became possessed of the gas undertaking so early as 1825, being, we rather think, the second local authority who purchased gas-works. But Beverley has not got on, as it once promised to do, and the undertaking has been no great success. We think, however, that the consumers have been fairly served. The price of gas was once as low as 2s. 11d., but during the coal famine it was raised to 4s. 2d., at which figure it still remains. The new capital is raised at the desire of ratepayers, who seem to object to the appropriation of all surplus profits to extensions and renewals, and think that the employment of capital, at a low rate of interest, will enable the Corporation to reduce the price of gas. When the addition proposed has been made, the total capital employed will be only £15,000, or something like 10s. per 1000 feet of gas made.

We conclude to-day our abstract of the Bills and Provisional Orders for the present session. Want of space prevents us from making some general observations; but there is one case to which attention must be called. The Town and County of Poole Gas Company apply to the Board of Trade for an Order, under the Gas and Water Works Facilities Act; and the Corporation of Poole apply to the Local Government Board, under the Public Health Act, 1875, for an Order to empower them to set up competing works. We shall await the decision in this case with much curiosity, since it is the first of the kind. The Public Health Act denies a local authority power to set up competing works, where a statutory company is in possession of the ground. But the Poole Company have, hitherto, neglected to arm themselves with statutory powers, by either Special Act or Provisional Order. We know nothing of the circumstances of the case, or of the feeling between the company and Corporation. Competition can hardly be intended, since Corporation and company propose the same terms—viz., fourteen-candle gas, at the maximum price of 6s. per 1000 feet. Perhaps the Corporation apply for the Order, with a view to compel the company to sell their undertaking. In any case, the example may serve as a warning. No gas company, likely to come in collision with a local authority, should be without a Special Act or a Provisional Order.

The Chartered Company have announced their intention to convert the whole of their share capital into stock, for which parliamentary power, and the consent of the shareholders, has already been obtained. It is rumoured, that the Board of Trade have given a provisional sanction to the amalgamation with the Imperial and Independent Companies; but we are in some doubt, as to whether, or not, the conversion will include the share capital of the companies last amalgamated.

Water and Sanitary Notes.

We this week present our readers with our usual abstracts of the accounts of the Metropolitan Water Companies; and, at the same time, offer them freely to those of our contemporaries, who are sure to appropriate them without acknowledgment. Not much comment is called for. The paid-up share and loan capital of the companies now amounts to something over eleven millions, almost all of which has been expended. Nearly two millions remain to be issued under the authority of the existing special Acts, and thus the authorized share and loan capital are seen to amount to about thirteen millions. The water-rents received by the several companies in the year 1874–5, it will be seen, amounted to nearly a million and a quarter. We are sorry that we are not able to give the rates charged by the several companies, but our inquiries on this head are not yet completed. It will be noticed that the companies maintained an average supply of more than 125 millions of gallons per day, or about 21 millions of cubic feet—a bulk beyond the conception of any but engineers. The water-rents per million gallons supplied, it will be seen, vary from £21 12s. 1d. in the case of the Southwark and Vauxhall Company, to £45 5s. 5d. in the case of the West Middlesex Company, who pay the highest dividend of all the companies. The progress of London, and the localities in which building operations are most actively carried on, is to be seen at a glance, in the increase of water-rents of the several companies during the past year. There is an increase in the case of every company, but the New River district exhibits the largest amount.

Leaving the accounts of the companies, to which, however, we may recur, we notice the singular fact, that since the Kent Water Company have assumed the offensive against the Metropolitan Board of Works, it has been discovered, that the water they supply is of a most pernicious character, and frightful disclosures, as to the consequences of its imbibition, are promised us. For our own parts, we do not like a very hard water, and we think that the quality of the supply from the Thames and Lea cannot be surpassed, having regard to drinking purposes and general domestic use. Still, we shall be astonished to learn that anything very dreadful results from the use of the Kent Company's hard water. Dr. Frankland, who seems to be affected with "sewage on the brain," makes the Kent Company's water his standard of comparison, in the case of the metropolitan waters. The Doctor, directly and indirectly, advocates the introduction of a soft water supply for London, but does not protest against people, in a northern district, being supplied with water containing enough Epsom salts to affect their bowels. We cannot, however, go into the general question raised, to-day.

The Water Committee of the Corporation of Liverpool have had a scare. They do plumbers work. The gas company have done gas-fitters work, and find themselves with £90,000 damages to pay in consequence. Suppose a careless plumber to be in the employ of the Corporation—and we ask, in the name of all householders and employers, and also the Plumbers Union, is there such a class of workmen to be found in the United Kingdom as journeymen plumbers?—why, the Liverpool Corporation might be let in for untold damages, in consequence of the flooding of warehouses. The Corporation propose, in view of such a contingency, to discontinue doing plumbers work. Perhaps they are wise. Would to Heaven everybody could dispense with the employment of plumbers!

Everything seems to show that a further development of the well system will be tried in Liverpool. We have before urged, that this is the only safe course the Council can adopt. Successful or not, it will tide the Corporation over some years, in the course of which some important changes may take place.

There is a great scramble for water in the North of England, and great complaints are made that some towns are encroaching on watersheds properly belonging to others. We have no space to allude to specific instances to-day, some of which, however, will be found recorded in our columns; but we may express an opinion, that the day is not far distant, when the Cumberland and Westmoreland lakes will be called upon to aid in the supply of Yorkshire and Lancashire, and that it would be well to take into consideration, while there is time, the advisability of joint action in the matter.

We intended to devote some space this week to a consideration of Mr. Haywood's most able report on Captain Liernur's Pneumatic System of Sewerage, but we are compelled to defer our remarks until our next issue.

An important rating case—that of the Assessment Committee of the Droitwich Union *v.* the Corporation of Worcester—is reported in another column. Since the judgment delivered seems to us in direct opposition to others which have been given, we think the respondents are justified in making an appeal. We may here express a hope that the present session will not pass away without some definite settlement as to the law of rating, whether as regards private or corporate property. The Government have undertaken to deal with one branch of the subject; let us hope they will not overlook the other.

THE WATER BILLS AND PROVISIONAL ORDERS FOR 1876.

(*Continued from page* 192.)

The following Bills are promoted by local authorities, to obtain powers (1) to start original water undertakings, (2) to extend limits, and enlarge existing undertakings, and (3) to effect a compulsory purchase of the undertakings of water companies.

The *Blackrod Water Bill* is to authorize the Local Board to

construct new works for the supply of the district of the Board; and, for this purpose, to borrow £20,000. Only ordinary provisions are proposed in the Bill.

The *Dewsbury and Heckmondwike Water-Works Bill* is to constitute a joint Water-Works Board, nine members of which are to be elected by Dewsbury, and three by Heckmondwike. Most of the provisions of the Bill are of purely local interest, and, therefore, need not be noticed. For the construction of extensive new works, the Bill seeks authority for the Corporation of Dewsbury to borrow £135,000, and the Local Board of Heckmondwike to raise £45,000. Authority is sought to create a funded debt, in lieu of borrowing on mortgage. The domestic water-rates proposed in the Bill are unusually low. Power is sought to make special assessments in the case of premises not rated to the poor, and also in cases where the poor-rates are considered by the authorities an unfair criterion. Beyond this the Bill only seeks the ordinary powers.

The *Dunfermline Water Bill* is to give parliamentary sanction to an agreement entered into between a water company and the Corporation of Dunfermline, in 1866, by virtue of which the Corporation then took possession of, and have since carried on, the water undertaking. The Corporation now seek power to raise £70,000 for extensions. As is commonly the case in Scotland, the rates are to be fixed on an annual estimate. The domestic rate is to be entirely at the discretion of the Corporation; but it is proposed that the public rate shall not exceed fourpence in the pound in each case, on valuations made by the Corporation. Water for external purposes—watering gardens, &c.—can only be taken from a pipe having a half-inch bore, except by special arrangement with the Corporation.

The *Edinburgh and District Water Bill* is to authorize the Water Trustees to construct additional works, and to abandon others, for which parliamentary sanction has been obtained. It is, further, to confirm some agreements, with landed proprietors and others as to sporting rights, and the compensation water to be given. The Trustees seek power to borrow a further sum of £50,000, for the purposes of this Bill.

The *Galashiels Municipal Extension, Police, and Water Bill* is promoted by the Town Council of Galashiels, to obtain powers, the objects of which are indicated in the title of the Bill. We notice only the provisions relating to water, which, if sanctioned, will authorize the Corporation to take water from the river Caddon, for the supply of the parishes of Galashiels and Melrose, and, for this purpose exclusively, to borrow £50,000. The domestic water-rate is to be settled on an annual estimate; the public is to be a fixed rate of one penny in the pound. A rather unusual provision will entitle the owner or occupier of any shop, mill, factory, or other business premises, to erect one tap on the premises, and draw water for the drinking purposes of his *employés*, free of charge. For the rest, the Corporation seek only ordinary powers in connexion with the water supply.

The *Lancaster Water and Improvement Bill* is to authorize a considerable extension of the water limits of the Corporation, and to sanction large additions to existing water-works. Power is sought to borrow £75,000 for water purposes.

The *Leicester Improvement Bill* is, among other things, to authorize the Corporation to effect a compulsory purchase of the Leicester Water Company, the consideration being paid in annuities to shareholders, the amount of which is to be settled by agreement, or by an arbitration, under the provisions of the Lands Clauses Act. The Bill will, probably, give rise to a strong parliamentary contest, a report of which will, no doubt, occupy many of our columns.

The *Leigh and Hindley Local Boards Bill* is to authorize a joint committee of the two Boards to take over the rights, privileges, duties, obligations, &c., &c., of the South Lancashire Water-Works Company. This company acquired statutory powers by an Act obtained in 1871; but they have never constructed any works, or done anything to furnish a supply of water. This Bill, then, is to enable the two Boards to take over the rights conferred, and the duties imposed, by the Act of 1871, in consideration of a payment of a sum of money to the company, the amount of which has been agreed upon, but is not set forth in this Bill. Power is also sought to construct works in addition to those authorized by the Act of 1871. For the purposes of this Bill, the Leigh Local Board seek power to borrow £75,000, and the Hindley Local Board £50,000. The affairs of the undertaking are to be managed by a joint committee of twelve, appointed by the two Boards, and a standing arbitrator to be elected by the two Boards, or by the Local Government Board.

The *Paisley Water Bill* is to extend the time allowed for the completion of works already authorized, and to empower the Commissioners to construct some in addition. The Commissioners also seek power to borrow a further sum of £50,000. The rates are, in this case, to be fixed upon annual estimate, so that the undertaking may be simply self-supporting.

The *Stockton and Middlesbrough Corporations Water Bill* is to enable the two Corporations jointly to make a compulsory purchase of the undertaking of the Stockton, Middlesbrough, and Yarm Water-Works Company, and to confer on the Corporations all the usual powers, in connexion with a water supply. The Act, if passed, is to be executed by a joint Board. It is proposed that the consideration may be, either a gross sum, or annuities, representing shares in the company. The Corporations seek power to borrow £1,200,000, and such further sum as may be required for the redemption of the annuities, at not more than twenty-five years purchase. Authority is also sought to construct additional works, not, we think, contemplated by the company in the Bill previously noticed.

The *Whitehaven Harbour and Town Improvement Bill* is, among other things, to authorize the Trustees of the Town and Harbour of Whitehaven to increase their daily take of water from Ennerdale Lake, from one million to one million and a half gallons. The Bill proposes to borrow only £2000 for water purposes.

Provisional Orders.

Gas and Water Facilities Act, 1871.

The following are applications to the Board of Trade, from gas companies, for Provisional Orders, under the Gas and Water Works Facilities Act, 1871:—

The Order of the *Brentford Gas Company* simply seeks authority to apply the money the company now have in hand, or have power to raise or borrow, to the purchase of additional land, and the erection of new works.

The *Chapel-en-le-Frith Gas Order* is to confer the usual powers on the private undertaking of Elias Gaskell, who is not, without further authorization, to employ more than £8000, in working the undertaking. Gas of fourteen-candle power is to be supplied, and the price is not to exceed 7s. per 1000 feet.

The *Cromer Gas Order* is to confer usual powers on the Cromer Gas and Coke Company, Limited. The capital is to consist of £5000 in original shares, and £5000 additional may be raised by new shares, the dividends on which are to be limited as usual. Gas of fifteen-candle power is to be supplied, and the price is not to exceed 7s. 6d. per 1000 feet.

The *Hythe and Sandgate Gas Order* is simply to authorize the Hythe and Sandgate Gas Company to apply money in hand, and capital they have power to raise, to the acquisition of additional lands, and the erection of new works.

The *North Middlesex Gas Company, Limited*, apply for an Order, empowering them to raise additional capital, to the amount of £35,000, and to borrow in the usual proportions in respect of it. The Order proposes no limitation of dividend on the new capital.

The *North Ormesby Gas Order* is applied for by the North Ormesby Gas Company, Limited, for power to raise additional capital to such an extent, that the total share capital shall not exceed £10,000. The dividends on whatever new capital is raised are to be limited as usual. The new capital is required for the purchase of land, and the construction of new works. Gas of fourteen-candle power is to be supplied, and the price is not to exceed 5s. 6d. per 1000 feet. Power is applied for to supply public lamps by average meter indication, at the will of either company or local authority. Any dispute respecting the same to be settled by arbitration.

The *Town and County of Poole Gas and Coke Company* apply for an Order. They have raised, and expended, share capital to the amount of £9600; they have further expended on the undertaking, out of profits, the sum of £10,520, and they now seek power to raise additional capital, to the amount of £19,880. The Order proposes that the expended profits shall be capitalized, and distributed rateably at usual. The dividend on this portion of capital is to be limited to four per cent., and on the new capital is to be six per cent. or seven, according as preference or ordinary shares are issued. Gas of fourteen-candle power is to be supplied, and the price, in any case, is not to exceed 6s. per 1000 feet; but the company seek power to vary the price to the extent of sixpence per 1000 feet in different parts of their district.

The *Retford Gas and Coke Company, Limited*, apply for an Order empowering them to raise £12,000 additional capital, and to borrow £6000.

The *Risca and Pontymister Gas Company* ask for an Order authorizing them to raise £4000 additional capital, the dividends on which are to be limited as usual, and to borrow £1000.

The *St. Anne's-on-the-Sea Gas Company*, apparently a new company, apply for an Order authorizing them to raise share capital to the amount of £15,000, for the acquisition of land and the erection of gas-works. Gas of fourteen-candle power is to be supplied, and the price is not to exceed 9s. per 1000 feet. The usual powers are sought in the Order.

The *Tottenham and Edmonton Gaslight and Coke Company* ask for an Order, authorizing them to raise £60,000 additional capital,

and to borrow £15,000. The dividends on the new capital are to be limited as usual. The company now propose to supply fourteen-candle gas at the maximum price fixed by their Act of 1859.

The *Worksop Gas Order* is to empower the Worksop Gas Company to raise £5000 additional capital, and to borrow £1250. The dividends on the new capital are limited as usual.

It is hardly necessary to say that the Gas-Works Clauses Act, 1871, is incorporated in all the above Orders.

The three following Orders relate to combined gas and water undertakings:—

The *Clacton-on-Sea Gas and Water Order* is to authorize the Clacton-on-Sea Gas and Water Company, Limited, to raise £5000 for gas-works. Fourteen-candle gas is to be supplied, and the price is not to exceed 7s. 6d. per 1000 feet. Power is also sought to raise £5000 for water-works, to consist of a well and the ordinary means for distribution. The usual water-rates are proposed, and all the ordinary powers, in connexion with both undertakings, are sought.

The *Connah's Quay Gas and Water Order* is applied for by the Connah's Quay Gas and Water Company, Limited. For the purpose of declaring and paying dividends, the share capital of the company is limited to £15,000, and the dividend proposed for this is only eight per cent. Gas of fourteen-candle power is to be supplied, and the price is not to exceed 7s. per 1000 feet. The water-works proposed consist of a small impounding scheme, with the necessary apparatus of distribution. The rates are to be about as usual, with the ordinary extra charges. All common powers are sought in respect of both undertakings.

The *Flint Gas and Water Order* is applied for by the Flint Gas and Water Company, Limited, who have raised £7000, and wish to increase their share capital to £10,000, and also to borrow £2500. The construction of additional water-works is proposed, and power is sought to maintain and continue existing gas-works. Gas of fourteen-candle power is to be supplied, at a price not to exceed eightpence *per hundred feet*. All ordinary powers are sought, in respect of both undertakings, and authority is prayed for the disposal of the whole, or any part, of the undertakings to any person, persons, corporation, or other public body, provided that the offer be first made to the Corporation of Flint, who will further have power to purchase, on giving six months notice. The terms are to be settled by agreement, or by arbitration, under the Common Law Procedures Acts.

The *Cefn Water Order* is to extend the limits of an existing water company, with a long name, and authorize them to raise further capital, to the amount of £30,000, and to borrow to the usual extent. The company further seek power to join with the Ruabon, Wrexham, Brymbo, and Chester Water Companies, in furnishing a joint supply, or water in bulk, for the supply of adjoining districts.

The *Chiltern Hills Spring Water Company* seek for an Order, simply to define the limits of their supply, which are several parishes in the county of Buckingham.

The *Flamborough Water Order* is to empower the Flamborough Water Company to construct works for the supply of the parish of that name. The capital of the company is not to exceed £4000. The works are to consist of a well and distributing plant. The rates are to be about as usual.

The *Leatherhead District Water Order* is to empower the Leatherhead District Water-Works Company, Limited, to raise capital to the amount of £32,000, with authority to enlarge an existing private undertaking. The rates proposed are about as usual, with the customary extra charges. The company seek all the ordinary powers conferred on water undertakings.

The *Newbury District Water-Works Order* is to empower the Newbury District Water-Works Company, Limited, to construct works for the supply of the district named. The share capital is not to exceed £20,000. The works proposed are a well and distributing apparatus. The rates and extra charges proposed are about as usual.

The *Neath Water Order* is primarily to amalgamate the undertakings of the Neath Water Company at Neath and Briton Ferry. It is proposed to guarantee shareholders in the Neath undertaking a preference dividend of ten per cent. Power is sought to raise further capital to the amount of £20,000, and to borrow to the usual extent.

The *Wantage Water Order* is to authorize a new company to construct works for the supply of the parish of Wantage. The capital is not to exceed £10,000. Usual powers are sought in the Order.

The *Wisbech Water Order* is to empower the Wisbech Water-Works Company to raise additional capital to the amount of £6000, and to borrow to the usual extent. The dividends are limited to the rates now generally allowed.

Public Health Act, 1875.

The following are applications to the Local Government for Provisional Orders under the Public Health Act, 1875:—

The *Poole Corporation Gas Order* is to empower the Corporation of Poole to construct and maintain works for the supply of gas to Poole. No power to borrow money is sought in the Order. Gas of fourteen-candle power is to be supplied, and the price is not to exceed 6s. per 1000 feet. The gas is to be tested as directed by the Gas-Works Clauses Act, 1871, the principal provisions of which are incorporated in the Order.

The *Silsden Gas Order* is to empower the Local Board of Silsden to set up Gas-Works to supply their district. The Board seek power to borrow £5000 for the purpose. The Order proposes to supply twelve-candle gas at a price not exceeding 6s. per 1000 feet; and further seeks all the ordinary powers of a gas company for the Local Board. Great expectations of the undertaking are evidently entertained, for the Board seek authority to apply surplus profits in any manner they may think best for the improvement of the district and the public benefit of the inhabitants.

The *Skelmersdale Gas Order* is to empower the Skelmersdale Local Board to set up works to supply gas in their district. Power is asked to borrow £8000 for the purpose. It is proposed to supply twelve-candle gas, at a price not to exceed 8s. per 1000 feet.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

LXXXIII.

Chimney Shafts or Stacks.

(*Continued.*)

We may here state, that the foregoing observations apply to the dampers of simple settings, that is, where clay or iron retorts only are employed in a bed.

With the compound settings, however, where the heat, after acting on the clay, is caused to pass into another bed containing iron retorts, then no control or obstruction of the heat exists at the passages of communication between the two settings; but, on the contrary, these are made of large dimensions, so as to permit of the free passage of the caloric from the clay to the iron retorts, the necessary dampers being placed on the beds of the latter. The supporters of compound settings maintain that these iron retorts are heated almost entirely by waste heat, which, if not applied for that purpose, would be lost. This, however, is contrary to reason, for, it being admitted (which cannot be questioned) that the proper control of the dampers is essential to economy of fuel for carbonization, it follows that by allowing the heat to pass with every facility, into another oven, where it is absorbed, it cannot be considered *waste* heat. The addition of the iron retort-bed is, therefore, merely an enlargement of the other, of which it forms a part; but whether the heating of iron retorts at a lower degree of temperature than the others, offers any advantages, is a question to be hereafter entered into.

It may be added that, for the waste heat alone to be applied, the iron retorts should obtain their quantity of caloric, after this has passed the dampers of the clay retorts, or by causing the heat of the main flue to be conveyed into beds of iron retorts, which we believe, in practice, would not be beneficial.

In illustrating the importance of a proper control of the dampers, we may mention an instance of works abroad manufacturing about 100 million cubic feet of gas per annum, which once came under our notice. In that case the consumption of fuel for heating the retorts was nearly 60 per cent. of the coke produced; but, by placing and adjusting dampers, which had hitherto been neglected (without any other alteration), a saving of about one-half of the fuel was effected, whilst the heats of the retorts were retained as before. Previously, through carelessness or want of intelligence, the large quantity of about 2000 tons of coke had been wasted annually, its heat passing off without the slightest indication, except in the balance-sheet, resulting in a direct loss to the shareholders of the company of nearly three per cent. And here it may be observed that a difference of one per cent. only in the fuel employed for heating the furnaces at Beckton, would represent a similar weight to that just stated. Hence the necessity for rigid economy in the fuel used in carbonizing; for, when misapplied in the way mentioned, it is irretrievably lost, without any possible advantage being derived therefrom, whilst, by the exercise of ordinary care, the prosperity of the company interested would be materially advanced.

The draught of stacks of moderate height and area, when in good working order, is equal to an exhaust of from 3-10ths to 1 inch, as indicated by the ordinary water-gauge. We have been informed that in the chimney of the Edinburgh Gas Company (to which we shall have occasion to refer hereafter), on account of its great height and ample area, a draught equal to 2½ inches exhaust is obtained.

Formerly, in small works the chimney-shaft was often built within the retort-house, and sometimes the beds abutting against it, so that, by the expansion of the brickwork by heat, it was thrown out of plumb. The shaft in small works should always be detached from any other buildings, and the main flue should communicate therewith, in such a manner, that any expansion thereof would not be liable to affect the stack in the manner described. This may be

attained by building the flue so as to slide into, and not abut against, the chimney.

In building stacks, some engineers place hoop-iron bond at intervals of three or four feet; but we are of opinion that a greater security against cracking is to build a portion of the courses, at like intervals, in Portland cement and sand in equal parts, the bricks being well wetted for the purpose. This, from the nature of the material, will be found stronger than iron hoop bonding, which has but little hold on the mortar.

At the period of the publication of the first edition of Clegg's "Treatise," considerable importance was attached to the construction of chimney-stacks; but since then they have been erected in such numbers, for various classes of industries, that the manner of building them is now well understood, so that any good bricklayer, on being furnished with drawings and instructions, will undertake to build them when of moderate dimensions, although in this, as in most other matters, it is generally wiser to employ men who are accustomed to the work, so long as their charges are moderate, which, however, is frequently not the case.

In the work referred to, mention is made of a chimney built with good concrete foundations on a quicksand, which afterwards settled bodily a depth of 16½ inches, and from this it is concluded that the only disadvantage attending a bad natural foundation is the expense of making an artificial one. With these statements we do not agree, as it is absolutely impossible to estimate, with such a foundation, the extent of settlement; nor can the vertical position of the shaft be assured under such conditions.

The first essential for a chimney-shaft is good, firm ground for its foundation, and where this does not exist, and proper solidity cannot be obtained, either by piling or otherwise, it becomes too hazardous to risk any settlement like that mentioned. We must, moreover, consider that the retort-house will be in the immediate vicinity of the chimney, and, therefore, a solid foundation is alike necessary for the benches of retorts as for the shaft.

Shafts are usually built either square, octagonal, or circular. The first, being the cheapest, is generally adopted for small works; but, whatever may be the form, the foundation is of the highest importance. Some writers give the side of the square of the foundation as one-eighth of the height of the stack, above the surface of the ground. This, in very solid ground, may be sufficient; but as any increase of cost in this respect is but small when compared with its utility, we would prefer erring on the safe side, by making the square of the concrete foundation one-sixth of the height of the stack. Thus, for a stack 36 feet high, its foundation would be 6 feet square; for a stack of 60 feet high, 10 feet square.

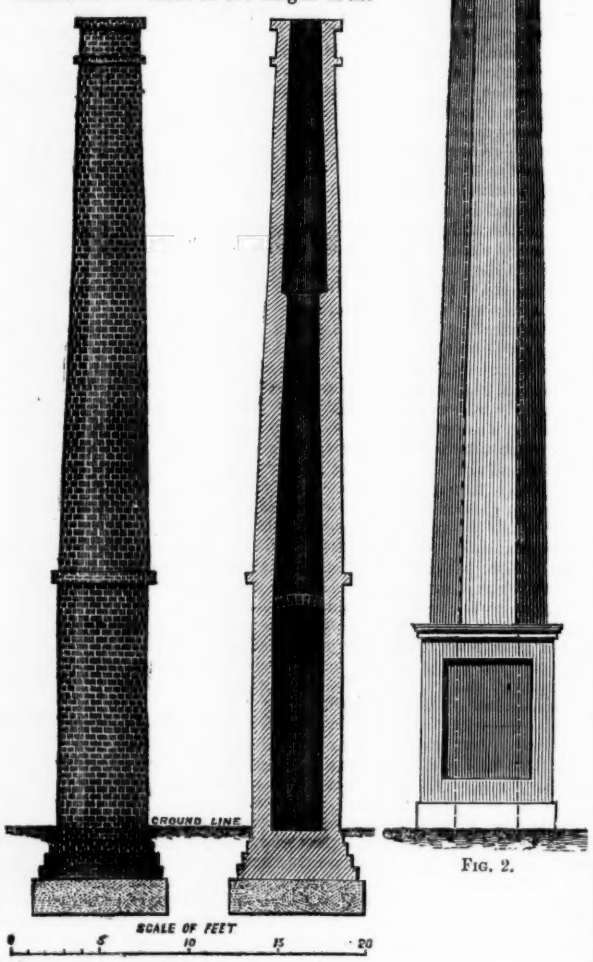


Fig. 1.

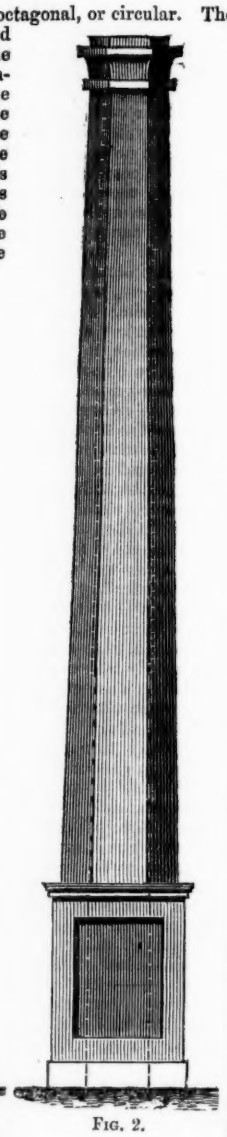


Fig. 2.

For small works, of a production of from three to four million feet per annum, a chimney 35 feet high, with an opening of 14 inches square, is sufficient, which, on the average, will cost about £35. For works of from ten to fifteen million feet production, a stack of 45 feet high, with an area of 20 inches square, is ample. In proportion to the capacity of the works, so are the shafts increased in dimensions, until attaining 100 feet high, with an area of about 20 or 25 square feet at the smallest part. Higher than this the shafts of gas-works are very rarely built.

In the accompanying engravings, Fig. 1, represents an elevation of a chimney-stack 45 feet high from the surface of the ground, together with a section of the same, built in the simplest manner, from motives of economy. .

The concrete foundation is 7 feet 6 inches square, and 2 feet deep. On this is commenced the brickwork of three courses of 6 feet 6 inches square, with sets off, which reduce it to 5 feet 6 inches square at the surface of the ground, all carried up in solid brickwork. At this point commences the pedestal of 6½ bricks (4 feet 10½ inches) wide, 1½ brick (13½ inches) thick, carried up plumb inside and outside; and at a suitable height is left the opening for communicating with the main flue of the retort-stacks. From the level of the main flue the chimney is sometimes lined with fire-bricks, 4½ inches thick, for about 12 feet in height; but this is a precaution which in a small work or stack, when rigid economy is necessary, may be dispensed with. At the height of 13½ feet is formed a cornice of two courses, and on this commences the stack, which is 1½ brick thick for one-half the height, where there is a set off; and, the rest of the shaft being continued one brick thick, the top part is rendered slightly ornamental by cornices, as shown.

A chimney of this description contains about 10,000 bricks, and costs about £65, when lined with fire-bricks as described.

For gas-works of medium or large capacity, stacks are usually constructed either octagonal or circular, which, in addition to presenting less resistance to the action of the wind, are more sightly. Indeed, in some instances, the designs of these structures may very justly be termed elegant, and such an external appearance is obtained at a comparatively trifling extra cost. The octagon shaft is extensively adopted at the numerous manufactures of all classes in the neighbourhood of Manchester, and offers no greater difficulties in building than the square form, all that is requisite being the angle bricks, shown in diagram, which correspond in width and thickness to the ordinary stocks, one end being made longer than the other, for the purpose of breaking joint. The angle bricks are placed both inside and outside, from the bottom to the top of the stack, all the rest being ordinary stocks.

Fig. 2 represents an elevation of an octagon chimney, 80 feet high, having an opening 4 feet 3 inches in diameter at its smallest part.

The side of the concrete foundation is 13 feet 8 inches, and 2 feet 6 inches thick. On this commences the footings of 12 feet square, diminishing by off-sets, all, as before described, being in solid brickwork, until reaching the level of the ground, where the base is 10 feet 6 inches square. On this is commenced the pedestal of 10 feet 4 inches, carried up four bricks thick to the height of 3 feet. At this point is a socle of 2 inches wide, from which the pedestal is built 3½ bricks thick to the under part of the cornice. The cornice is then formed, as well as the base to receive the octagon stack.

The diameter of the base of the stack is 9 feet, measured between the sides of the octagon. The stack is built 2½ bricks thick for a height of 16 feet, where it is reduced by an off-set, in the interior, of half a brick, and is accordingly two bricks thick to the height of 32 feet. Here it is further reduced by another off-set to one and a half brick thick, the last 16 feet of the stack being one brick thick, built in cement, and, as before recommended, a portion of the courses at intermediate distances should be laid in cement, or hoop-iron bonding will have to be built in with the courses at intervals of 3 or 4 feet apart. The section is indicated by the dotted lines.

The chimney is also required to be lined with fire-bricks 4½ inches thick, to a height of 32 feet, which enter into the formation of the stack, as described.

In some chimneys of large dimensions there are two shafts, the one within the other, having an intervening space between them. By this arrangement the great heat is confined to the internal part, so that the exterior is not exposed to those fractures which sometimes occur when the shaft is composed of one wall.

(To be continued.)

Birmingham Water Supply.—Dr. Hill, the medical officer of health, reports that the water supplied to the town, during the month of January, was clear, with the exception of a few suspended particles; the quantity of organic nitrogen showed a marked diminution, that of organic carbon had slightly declined, while the "previous sewage contamination" was rather higher.

Hull Gas Supply.—Mr. James Baynes reports that the illuminating power of the gas supplied to the district of Sculcoates and Myton by the British Gas Company during January averaged 16 candles At no time was free ammonia or sulphuretted hydrogen present to the ordinary tests. The results for the month are—

	Max.	Min.	Mean.
Illuminating power standard sperm candles	17·32	15·29	16·08
Grains of sulphur per 100 feet	28·00	27·00	27·50

Mean barometer and temperature in experiment-room:—Bar., 30·24; tem., 56°.
In the *East District*, Mr. James Baynes, jun., reports that during the month of January the gas sent into this district by the Sutton, Southcoates, and Drypool Gas Company yielded as follows:—

	Max.	Min.	Mean.
Illuminating power standard sperm candles	16·48	15·99	16·25
Grains of sulphur per 100 feet	—	—	8·30

Mean barometer and temperature in experiment-room:—Bar., 30·33; tem., 52·30°.

Correspondence.

THE SALE OF SHARES BY AUCTION.

SIR,—In your leading article of the 8th inst., you say, on this subject, that the raising of new capital by the sale of shares at auction "will leave original proprietors, so far as the shares they already possess are concerned, in exactly the same position." This is true, doubtless, as regards the amount of dividend receivable; but the case in favour of the companies is surely understated in respect to the greater security which will attach to the holdings of existing shareholders, by the introduction into the business of a large amount of non-dividend-bearing capital.

I am surprised that this view of the subject has not presented itself more prominently to the minds of proprietors of metropolitan gas stocks. The capitals of most of the companies are unduly large in proportion to the business transacted. It is only a few—say three—of the smaller companies whose invested capital and business bear a fair relation to each other. That being so, the companies burdened with heavy capitals require to maintain a higher price for gas than is consistent with public policy, in order to pay maximum dividends, and they dare not face their shareholders with less.

Now, the expedient of bringing in new capital from the public at 4 to 5 per cent., instead of subscribing it among themselves at 10 per cent., will have the effect, in ten to twelve years, of making the average dividends payable on the whole capital 6 per cent. to 7 per cent., instead of 10 per cent.; and by this process the selling price of gas will be reduced, and the original shareholders secured in their investment. In other words, if the future capital of metropolitan gas companies be raised by the sale of shares at public auction, the public will buy so as to pay themselves perhaps 4 per cent., or at the most 4½ per cent., as in many provincial towns; and thus £100 will realize £220 to £250, the difference between par and the sum realized being expended on the extension of plant without bearing dividend. It is obvious that every £1000 gratuitously contributed to the capital of a business must consolidate and make more secure the actually subscribed capital already invested.

From this point of view—and I contend it is one of great importance—it is to the interest of existing shareholders to offer new capital to the outside public. Any business employing an exaggerated capital is in a perilous position, because the selling price of the manufactured article must necessarily be unduly high, in order that the capital be remunerative; and this is the secret of dissatisfaction among the customers of most of the metropolitan gas companies.

The proposal to require companies to raise new capital by loans is manifestly untenable, because it would shortly destroy the proper relation between the security and the loans effected upon such security, giving the preponderance to the latter instead of to the former.

No doubt the raising of new capital by the sale of shares at public auction is the right thing. The security is ample. Under proper conditions of sale—among others, restricting the number of shares offered in one lot, so as to enable men of moderate means to become purchasers—the public will be only too glad to have such an opportunity of investment. The inducement on the part of companies to expend money recklessly, and to create new capital for the benefit of shareholders, will be removed, and no means can be devised which will so certainly, in the end, bring about the result at which all the legislation and expense of late years has aimed—namely, the obtaining of good gas at a cheap rate.

G. W. STEVENSON.

4, *Westminster Chambers, Feb.* 12, 1876.

SULPHUR IN GAS.

SIR,—The above was the heading of that unfortunate letter which you state Mr. Livesey was "fortunate enough to get inserted in the *Times*." A French *savant* once said, that if he had been at the elbow of Deity when He was arranging the laws of the universe, he thought he could have given Him some good practical hints. So, in this case, I think, had I been at the throne of the gas Olympus of our metropolitan gas deity, I could have given him good advice as to the publication of his letter. It would have been *Punch's* laconic advice to "persons about to marry:"—"DON'T."

We all wish Mr. Livesey well—I do. He is the worthy son of a worthy father; he inherited from that father the very best metropolitan gas management. His path has been strewn only with flowers of the rarest and choicest kinds, the cultivation of which should have been a labour of love and pleasure; yet, after a life of such experience, his letter in the *Times* is couched in the language of despair. He almost throws up the sponge, longing for the time when the metropolitan authorities may take up the gas-works, for then, he thinks, we would hear no more of the "sulphur question."

That is a conclusion at which I cannot arrive, nor do I think it is one that, in the interests of either gas consumers or gas managers, we should deem a desirable one. For a year or two back I have been thinking that we were to hear no more of the "sulphur question." I have heard nothing of it during that time.

The numerous complaints of the local authorities, the apologies of the gas companies, have all ceased for at least two years, and what has caused Mr. Livesey to revive the question, I cannot imagine.

At the late trial, *Patterson v. The Gaslight and Coke Company*, reported so recently in your pages, it was proved by defendants witnesses, and not disputed by plaintiff, that the gas of that company for the last four years has been uniformly pure, within the requirements of the Act of Parliament; and, according to the summing up of the judge, the change from impurity to purity has been done at the expense of four-hundredths of a penny per 1000 feet—not an expense that should frighten gas manufacturers. But that by no means was a statement of the whole question, although it was sufficient for the judge's summing up.

There remains the saving which has been effected by a much reduced use of cannel coal, while the parliamentary standard has been maintained—a saving that will far more than compensate for the fraction of a farthing increase in purification.

There is also another saving, not so easily estimated—the abolition of all risk of being fined, to say nothing of the saving from that continual worry, and wear and tear of body and mind, to which gas managers were previously subjected, and after which Mr. Livesey looks so well.

There may also be some saving to the consumers—to the drapers, with finely-coloured fabrics to sell; and to the silversmiths, whose wares are not by any means improved by a sulphur coating.

Mr. Livesey, in his *Times* letter, tells us how uncomplainingly the Parisians swallow their dose of sulphur. Perhaps so (?); but, if so, it only shows what sorry stuff they are made of. There is a better ring from the metal of which we Britons are made, and London gas-makers may rest assured that the British public will never agree to swallow sulphur, except as medicine, if it can be taken out of their gas at the small expense of 4-100ths of a penny per 1000 feet.

However, this very matter has recently been the subject of Parisian trouble, and a sad commentary on Mr. Livesey's philosophy came to us from Paris, a few days before he wrote:—

The *Globe* of the 28th of January, copying from the *Journal des Débats*, writes as follows:—"Only a year has passed since the Grand Opera was opened, and already the hangings and decorative work show manifest and dismal traces of the decay to which all mundane things are doomed. It is the colouring of the dyed stuffs, and especially the red and pink tints, which have faded most deplorably—presenting the appearance of having been well washed and drenched with water. But the walls and paper, and all the painted and gilt woodwork have been almost equally affected, and show similar signs of decay;" and after reciting several causes—such as dust, condensation of breath, &c.—it states: "The other and still more fatal agent is the sulphurous vapour given off by burning gas;" and the estimate that has been made to restore the damage is 3000 guineas.

If this is the cost in one year in one Parisian place of amusement, what must be the total for all the theatres and all the decorated private houses? Nothing short of a million will look at it. I suspect the gas of Paris is very impure, if only oxide of iron is used in the purification—I expect it is. I trust, however, that it may be found that bad ventilation increases the evil; but, however that may be, there is no doubt that *we* must not fold our arms and take to counting the stars, but stretch them out towards the earth, and try to learn still more, that such disgrace as lies at the door of the Paris Gas Company may never lie at any door of ours.

GEORGE ANDERSON.

BURNER TESTINGS.

SIR,—I observe that an error was made by me in the table of my experiments, which has brought forth the letter from Messrs. Henry Greene and Son in your last.

The consumption of gas by the Brönner burner should read, 3·2 cubic feet, *not* 2·2, as printed in the JOURNAL of the 1st of February. Please correct this in your next.

Dundee, Feb. 9, 1876.

B. M. M'CRAE.

SIR,—In Mr. Sugg's letter, I observe, he states that Mr. Pattinson has not been able to develop the possible amount of light to be got out of Newcastle gas. Possibly it was not Mr. Pattinson's intention to develop concentrated intensity, but rather diffused general light. Whether this be so or not, Mr. Sugg has assumed too much. He must know how difficult it is to rate and develop the possible amount of light in his burners and jet photometers to the satisfaction of all who use them. Of course, I need not remind him of this fact, that if the maker, as indicated by the letter referred to, has not yet developed the possible amount of light, but continues improving, and may next month introduce the most improved instrument, what force is there in his letter, except a puff about the improvement he has for sale?

Mr. Sugg's attempt to limit one of the three elements, and the most important on gaslight and every other light, must ever remain imperfect, while the other two are changeable either in quantity or quality, or both—that is, while the compound, coal, under destructive distillation is variable in the yield of the two elements which form hydrocarbons, the development of the burner must be as changeable as the quantity and quality of gas produced from the same kind of coal; because, as the combining proportions of the three elements are fixed, any professed attempt to alter them ought to be accounted presumption in the absence of proof. Here I suggest to all your readers who are experts on the photometer, to test their gas with the most improved "London" or their own standard burner under 2, 3, 4, 5, 5·5, or 6 cubic feet per hour, reduced in each case to the parliamentary standard. Repeat the same with any common burner, and average each batch of testings, the common burners will yield the best results. Not only so, but the common burner will not allow rich hydrocarbons to go unconsumed, because around it the oxygen is not limited to cooling or heating; therefore the light in the common burner is the cheapest general one.

A well-made common bat's-wing, by any maker, is the best test burner. The price will allow every consumer, however poor, to have a burner in every respect equal to the standard, should it be adopted.

I do not wish further to intrude on your valuable space at present. Other questions may arise, involving the whole question of gas lighting; but I am convinced that the more light is developed in rating a burner for the test-room, the more concentrated is that light, and the less general in its results; and as gas supply and consumption ought to be a mutual question, apart from expensive burners, developed light, with glasses, globes, &c., allowing the transaction of buyer and seller on the most common terms, these are my reasons for these few lines.

W. L.

IS THE MANUFACTURE OF SULPHATE OF AMMONIA A NUISANCE?

SIR,—May I ask the favour of an answer to the following question in your next issue?

My directors propose to erect plant on their works, to convert the ammoniacal liquor into sulphate of ammonia; but the Public Health Act, 1848, clause 64, enacts "that the business of a bone-boiler . . . or other offensive business, trade, or manufacture, shall not be newly established in any building or place, after this Act is applied to the district in which such building or place is situated, without the consent of the local board."

Now, what I wish to know is, whether commencing the manufacture of sulphate of ammonia upon works which, ten or twelve years prior to the passing of the Public Health Act, were used for the purposes of carrying on the trade of a gas company, and upon which the company may be said to have acquired a prescriptive right to carry on their business, is to be considered a "newly-established trade," within the meaning of the Act of Parliament?

Does not the manufacture of sulphate of ammonia form part of the trade of a gas company, a branch of the business which they may take

up if they will? Unless I am mistaken, the Gas-Works Clauses Amendment Act, 1871, recognizes it as part of the undertaking and business of a gas company to work up their residual products. Unfortunately, we possess no parliamentary powers, but the concern is carried on under the Companies Acts of 1862 and 1867. I have consulted the clerk to the local board, and he is unable to decide upon the point.

Malton Gas-Works, Feb. 11, 1876. HENRY TOBEY.

APPOINTMENT AND REMUNERATION OF GAS COMPANIES SECRETARIES.

SIR,—The Act of 1845 (The Companies Clauses Consolidation Act) is incorporated with the Special Act of 1846, alluded to in my communication. I have known the working of the Special Act from its passing the Legislature, and never heard until now of the status of the secretary, as directly responsible to the shareholders, being questioned. He is elected by shareholders by resolution in a general meeting, having been (probably) recommended by the directors. In these days of limited liability Acts, it is well, I think, that modern directors should remember that there have been alterations, not necessarily repeals, of all the commercial laws of our country during the last thirty years.

I. N. K.

Parliamentary Intelligence.

GAS AND WATER BILLS, 1876.

WEDNESDAY, FEB. 9.

The Examiners reported the Standing Orders had been complied with in respect of the Tunbridge Wells Gas and Slaithwaite Gas Bills.

HOUSE OF LORDS.

TUESDAY, FEB. 8.

On the motion of the LORD PRESIDENT, a copy of the report by the Board of Trade upon all the Railway, Canal, Tramway, Gas, and Water Bills of the present session, was ordered to be laid before the House, and printed.

The Rules made by the Board of Trade, under section 14 of the Gas and Water Works Facilities Act, 1870, Amendment Act, 1873, in respect to applications for Provisional Orders under the 1870 Act, were presented.

FRIDAY, FEB. 11.

The LORD CHANCELLOR acquainted the House that the Standing Orders have been complied with in respect of the bills which have been noticed, as passed by the Examiners.

HOUSE OF COMMONS.

TUESDAY, FEB. 8.

Mr. HUBBARD gave notice that on Wednesday, Feb. 16, he would move for leave to bring in a bill to amend the Valuation of Property (Metropolis) Act.

Sir JAMES HOGG gave notice that on Wednesday, Feb. 9, he would move for leave to bring in a bill to amend the Metropolis Gas Act, 1860; to make further provisions for regulating the supply of gas within the limits of the said Act, and for other purposes relating thereto.

WEDNESDAY, FEB. 9.

The reports from the Examiners that, in the cases of the petitions for the Rosstrevor Improvement, and Stockton and Middlesbrough Corporations Water Bills, the Standing Orders have not been complied with, were referred to the Select Committee on Standing Orders.

BURGHS AND POPULOUS PLACES (SCOTLAND) GAS SUPPLY BILL.—This bill, to make provision for lighting burghs and populous places in Scotland with gas, was ordered to be brought in by Sir Windham Anstruther, Mr. Orr-Ewing, Mr. Grieve, and Mr. William Holms. The bill was afterwards presented, and read the first time. To be read a second time on Wednesday, March 15.

METROPOLIS GAS COMPANIES BILL.—This bill, to amend the Metropolis Gas Act, 1860, to make further provision for regulating the supply of gas within the limits of the said Act, and for other purposes relating thereto, was ordered to be brought in by Sir James Hogg, Sir Andrew Lusk, and Mr. Goldney. The bill was afterwards presented, read the first time, and referred to the Examiners of Petitions for Private Bills.

FRIDAY, FEB. 11.

Mr. RAIKES reported that, in accordance with Standing Order 88, it had been determined, with the concurrence of the Chairman of Committees of the House of Lords, that the private bills contained in the following list should originate in that House of Parliament—viz., Blackrod Gas, Blackrod Local Board, Braceborough Water, Bridgewater Water, Edinburgh and District Water, Galashiels Municipal Extension Police and Water, Leigh and Hindley Local Boards, Llandudno Improvement, Llandudno Water and Gas, Maidenhead District Gas, Southwark and Vauxhall Water, Sutton Gas.

THE GASLIGHT AND COKE COMPANY.—Mr. J. O. Phillips, the secretary of this company, has addressed a letter to the daily papers, in answer to very numerous inquiries on the Stock Exchange, on behalf of trustees and others, stating that it is the intention of the directors to convert the shares of the company into stock. The necessary parliamentary power and the sanction of the shareholders having been already obtained, the conversion will be effected at the earliest convenient opportunity.

BODMIN GAS COMPANY.—The annual meeting was held on Monday, Feb. 7, when the report and balance-sheet showed that during the past year the working expenses had been £1720, and the receipts £2150. The directors stated that the works were generally in good order, but a rearrangement of the retort-beds would have to be made during the ensuing summer, which would involve a large outlay. The consumption of gas was gradually on the increase, and in a short time it was not improbable that the military depôt, now in course of construction, would require a supply equivalent to about 400 lights, in which case some of the present mains would have to be re-laid. In case of such outlay being required, the directors thought it would be advisable to increase the capital of the company by adding 100 additional shares. The price of gas had been reduced from 6s. 6d. to 6s. 3d. per 1000 feet, with a discount of 6d. for cash payment. The directors would be able during the forthcoming summer to further reduce the charge by 3d.; practically diminishing the price to 5s. 6d. 770 tons of coal had been used during the past year, and the quantity of gas made had been 6,408,700 feet. The directors recommended that a dividend of 8 per cent. be declared, and that the balance of £429 be carried to the reserve-fund, now amounting to nearly £800. In consequence of the probable extensive additions to the works, the directors were of opinion that the proposed issue of 100 supplementary shares of £4 16s. each should be effected at once, rather than that amount should be taken from the reserve-fund. The chairman (Mr. S. Hicks) moved the adoption of the report, and after some few remarks it was unanimously adopted. A vote of thanks was given to Mr. Thomas, manager of the works.

Legal Intelligence.

HIGH COURT OF JUSTICE—CHANCERY DIVISION.

THURSDAY, FEB. 10.

(*Before Vice-Chancellor* MALINS.)

THE RICHMOND WATER-WORKS AND SOUTHWARK AND VAUXHALL WATER COMPANIES *v.* THE RICHMOND VESTRY.

Mr. PEARSON, Q.C., with him Mr. BEAUMONT and Mr. MICHAEL, moved for an injunction on behalf of the plaintiffs, to restrain the vestry from proceeding with their intention of erecting and constructing water-works for the parish of Richmond, at the expense of the parish, until they had given the plaintiffs the notice they were required to give under the Public Health Act of 1875, and, if necessary, submitted to an arbitration, as provided by that Act.

Mr. GLASSE, Q.C., Mr. LANG, and Mr. MEADOWS WHITE, appeared for the defendants.

Mr. PEARSON said the whole question was, what were the rights of the Richmond Company under the Act of 1875? and whether the Richmond Vestry had or had not properly complied with the provisions of the Act of Parliament. The nature of the case was this. The Public Health Act of 1848 gave very limited powers to vestries with regard to the supply of water to parishes; but in 1875 an Act was passed, being the 55th chapter of the Acts of last session, which enlarged those powers, and gave a parish a right, under certain circumstances, of providing water for all purposes in the parish, at the expense of the parish. That Act, however, like the Act of 1848, contained very careful provisions to prevent injustice being done to companies which had been established by Act of Parliament for the purpose of supplying such parishes with water, in case such parishes decided on supplying themselves. Both the Act of 1848 and that of 1875 contained a provision that it should not be lawful for the vestry or parish to undertake and supply itself with water, and to construct water-works at the expense of the parish, in any district in which any company was established by Act of Parliament, for the purpose of supplying water to it, without first applying to that company and inquiring of them whether they were able and willing to supply the water which was necessary; and in case of any difference of terms between them as to the charge to be made, or the manner in which the water was to be supplied, going to arbitration upon that difference. That provision was contained in section 52 of the Act of 1875, and was expressly put into the Act for the purpose of protecting companies already supplying any parish with water, and to prevent that injustice being done, if Parliament had first of all given a company the power to supply a particular district with water, and encouraged them to construct works for that purpose, and actually invited persons to subscribe money to carry out those purposes, and then suddenly passed an Act authorizing the parish to construct their own water-works, and so putting an end entirely to the business of the company, and shutting them up without giving any compensation.

The VICE-CHANCELLOR: You say you are able and willing, and are a water company within the meaning of this section.

Mr. PEARSON: Yes; a water company, founded in 1835, and ever since then had supplied the district with water, and had been doing so in constant communication with the vestry. In 1873 the vestry recognized the existence of the company, and the necessity, under the Act of 1848, which was then in force, of giving notice; but now they said that, although they did that in 1873, they were not bound to do it in 1875. In 1835 the original Act for the Richmond Water-Works Company was obtained, which Act enabled the company to take water from the river Thames at a particular spot. The Southwark and Vauxhall Water Company were a company supplying another district with water, but some of their mains came through the parish of Richmond, and they were empowered to take water from the river Thames at Hampton, where the water was much cleaner than at Richmond; and as complaints had been made, from time to time, of the quality of the water, the Richmond Company agreed with the Southwark Company to obtain their water from them. The first idea was that an Act of Parliament should be obtained, authorizing the amalgamation of the two companies; but that fell through, and in 1860, the Richmond Company, feeling that they could get better water from the Southwark Company than they could supply themselves with direct from the river, came to an arrangement of this nature with them. Of course, they could not, without a special Act of Parliament, sell their powers to the Southwark Company; but certain members of the latter company agreed to buy up the shares of the Richmond Company, and thus constitute themselves, as they lawfully might, the Richmond Company. This was done, and thus, though the Richmond Company, with all its powers, was kept alive, it was by this means in perfect alliance with the Southwark Company; and from 1860 down to 1875, the latter, either under the name of the Richmond Company, or, for convenience sake, using their own name, had supplied Richmond with water, and had been dealt with by the Richmond Vestry and parish as the parties who represented, and who were, in fact, the Richmond Company. They had, from time to time, done everything which was necessary for carrying out the supply of water, had been paid their rates, and so on; and it was this company which the ungrateful vestry now turned round upon and said, "Although for 15 years you have done everything we asked, we now think we can borrow money and make water-works to supply ourselves, and get, what we think, a sufficient supply of water cheaper; and without giving you, under the Act of 1875, the notice you are entitled to, or going to arbitration at all, we will construct our own works and oust you altogether."

The VICE-CHANCELLOR inquired where they proposed taking their water from.

Mr. PEARSON said they intended making an artesian well, or a number of them, and having a reservoir in Richmond Park.

Mr. GLASSE said they had powers from the Crown to sink a well in the park, and more than sufficient to supply the purest water to the town of Richmond.

Mr. PEARSON remarked that he did not care whether they had powers from the Crown or not.

The VICE-CHANCELLOR asked if they had sunk the well, to prove the supply of water?

Mr. BEAUMONT: No.

Mr. GLASSE: I say yes.

Mr. BEAUMONT said the water company had tried this plan years ago, and it failed.

The VICE-CHANCELLOR said he would rather have water from an artesian well than from the river, if he could get it.

Mr. PEARSON: Their notion is that there ought to be water there, and therefore they say there will be water.

Mr. GLASSE: They tried their hands in Parliament to increase the rents, and failed. They are trying again in this session to obtain an Act.

The VICE-CHANCELLOR: You do not seek to restrain them from going to Parliament?

Mr. PEARSON: No. The vestry did not require to go to Parliament. They were going to borrow money on the security of the rates, which the plaintiffs, as ratepayers, objected to. They were simply going on a wild-goose chase after water.

Mr. GLASSE: A wild goose never makes a mistake as to water.

Mr. PEARSON: Sometimes it does. At any rate the vestry would. They were going to bore close to the bank of the river, on the site of the old Richmond Brewery.

The VICE-CHANCELLOR: Then they would have to pump the water up from the well into the park.

Mr. GLASSE: Yes. Their plan was approved by the Local Government Board.

The VICE-CHANCELLOR: The plaintiffs say that as long as they are able and willing to supply water, they are entitled to do so.

Mr. GLASSE said he should contend that they were not able, and were not a company lawfully established. That was the real question at issue. There was no need to trouble the court with the question, which was the best water. The question was, whether the Southwark Company, or the defunct Richmond Company, were a company lawfully established within the meaning of the Act. If they were, they were right; if not, the defendants were right.

Mr. PEARSON quite agreed they had better not look into the purity of the water, or into that of the acts of the vestry.

Mr. GLASSE: Or into the projects of the water company to increase the rents, which Parliament would not sanction.

Mr. PEARSON said they had a perfect right to go to Parliament. He then proceeded to read and comment on the statement of claim (which, under the new Judicature Act, takes the place of the Chancery bill), which set out, in greater detail, the facts of the case which he had already opened. The contention of the vestry was, that inasmuch as the Richmond Company did not continue to take their water from the river at Richmond whence they were empowered—but not compelled—to take it, they had ceased to exist. That, in fact, because they took good water from Hampton, instead of bad water from Richmond, they ceased to be a company.

Mr. GLASSE said that was not his contention; but that the Southwark Company were supplying water to Richmond, which they had no power to do.

The VICE-CHANCELLOR: Are the Richmond Water-Works Company now supplying water?

Mr. PEARSON: Yes.

Mr. GLASSE: No. They never have since 1860.

Mr. PEARSON: The Richmond Company at this moment are supplying water to the town, and the people were rising up against it. If they had washed their faces that morning, they had done so with water supplied by the Richmond Company.

Mr. GLASSE said the company ceased to exist in 1860.

The VICE-CHANCELLOR asked what water Mr. Glasse said the people washed their faces with.

Mr. GLASSE: With that supplied by the Southwark Company, outside the limits of their Act. Therefore, for this purpose, they were a company not lawfully constituted; and, therefore, they were not entitled to be served with a notice under the Act of 1875.

The VICE-CHANCELLOR inquired what was the definition of a company given in the Act.

Mr. BEAUMONT: Any person, or body of persons, incorporated to supply, or who may supply water for his or their profit.

Mr. GLASSE said that had been judicially interpreted to mean supplying under lawful authority.

The VICE-CHANCELLOR said he supposed it must mean a company able and willing, and lawfully authorized, to supply the parish with water.

Mr. PEARSON said that was so. Mr. Glasse contended that the Richmond Company were defunct, but he could hardly do so, because in 1873 the vestry served the company with notice of the application they were going to make to the Local Government Board. And, in the second place, it was not the Southwark Company which supplied Richmond, but the Richmond Company by means of the Southwark Company. The only difference was that instead of having a short pipe from the river at Richmond, they drew the water from the mains of the Southwark Company, which brought it from Hampton.

The VICE-CHANCELLOR: The real question seemed to be whether the Richmond Water-Works Company were now supplying the district with water.

Mr. PEARSON: Whether they were authorized to do so.

Mr. GLASSE: Whether they were doing it *de facto*.

Mr. PEARSON: They must be "able and willing" to do it. Supposing the company had only been created in the last session, and had not yet commenced the supply, if they were able and willing to do so, they were entitled to the notice. However, his contention was, that from 1835 down to the present time, they had been and still were, supplying Richmond with water.

The VICE-CHANCELLOR asked why the Southwark Company were joined as co-plaintiffs.

Mr. PEARSON said it was thought better to do so, as there could be no objection made under the Judicature Act on the ground of misjoinder.

The VICE-CHANCELLOR inquired how much the new works were going to cost.

Mr. PEARSON: £28,000 they were going to borrow.

Mr. GLASSE: Which was sanctioned by the Local Government Board.

Mr. PEARSON: It was only sanctioned subject to the question whether they had any right to do so. When they applied to the Local Government Board, they served the Richmond Water-Works Company with notice of the application, and yet now they said they were not bound to give them notice under the Act of 1875. The defendants said the plaintiffs were evading the Act of Parliament, but it had been said by a learned judge that there was no such thing as evading an Act of Parliament. Either a certain thing was forbidden by an Act of Parliament, or it was not; if it were it could not be done, and if it were not, there was no evasion. The shareholders in the Richmond Company had a perfect right to sell their shares to individual shareholders in the Southwark Company, which they did. Then, on the 20th of March, 1862, it was resolved that the officers of the Southwark Company be appointed to the same offices in the Richmond Company, and since then the business had been conducted by one set of officers.

Mr. GLASSE asked if the minute-book was in court.

Mr. PEARSON said he did not know.

Mr. GLASSE said that showed it was not. It was evident that resolution did not include the directors.

Mr. PEARSON said the same objection was taken in the case of the *Swindon Water-Works Company v. The Wilts and Berkshire Canal Company*, that the latter company had held no meetings, and that there were no regularly appointed directors; but it failed. The individual shareholders of the Richmond Water-Works Company were changed, but the company itself remained; and if there had been any default in the supply of water, the company could have been sued for penalties. There were directors now.

Mr. GLASSE: Appointed recently. From 1860 to 1875 there had been no directors appointed.

Mr. PEARSON: There was no necessity for it.

The VICE-CHANCELLOR said that, having sold all the shares to shareholders in the Southwark Company, there did not seem much necessity for continuing to elect directors, or hold meetings. The point was whether the company were still in existence.

Mr. GLASSE said it was not, and that the Southwark Company were supplying water without any lawful authority.

Mr. PEARSON: asked when it could be said to be defunct.

Mr. GLASSE: In 1860.

Mr. PEARSON said that was impossible.

Mr. GLASSE said the legal inference was that it was dead seven years after it was last heard of.

Mr. PEARSON contended that it was absurd to suppose that a company was dead because the individual shareholders had changed. This very arrangement was made in order to keep alive the Richmond Company.

The VICE-CHANCELLOR asked how the demands were made for the payment of the water-rates.

Mr. PEARSON said they were made in the name of the Southwark Company, because they had acted for the Richmond Company.

Mr. GLASSE handed up a number of receipts for a series of years, beginning in 1858. Down to 1861 they were in the name of the Richmond Water-Works Company, but from that time they were in the name of the Southwark and Vauxhall Company. It was a mere attempt to do indirectly that which the law did not allow to be done directly.

The VICE-CHANCELLOR said it looked rather like the Richmond Water-Works Company dying a natural death—selling itself to the Southwark Company.

Mr. PEARSON: They had no power to do that, and did not do it. But they acted in unison. When all the shares were sold to shareholders in the Southwark Company, there was no necessity for having separate offices and a separate staff. The receipts had been kept distinct, and dealt with as provided by the agreement. It was like a man who had possession of a settled estate, and could not sell it, but had unlimited powers of leasing; he could grant a lease of 999 years, which was practically equivalent to a sale.

The VICE-CHANCELLOR asked if the Richmond Company had paid separate dividends since 1861; had they held any meetings, or paid any dividends?

Mr. PEARSON contended it did not matter whether they had or not. The only real defence was that the Richmond Company had not supplied the parish with water since the sale of the shares; but the notice given by the vestry in 1873 was sufficient to show that this contention could not be sustained; and, in fact, this notice was not relied on as having been a proper notice under the Act of 1875. How could they say, after that, that the company died in 1861?

Mr. GLASSE here drew attention to the notice on the back of the demand notes for the water-rates, which referred to certain clauses in the General Water-Works Act, which Act was not incorporated in the Act of the Richmond Company, though it was in the Act of the Southwark Company.

Mr. PEARSON repeated his argument that the Richmond Water-Works Company could have been sued for penalties if it had not supplied the district with water. The demand notes were simply sent out by the Southwark Company as agents for the Richmond Company.

The VICE-CHANCELLOR said the Richmond Water-Works Company was the only one authorized to supply Richmond with water; and as the parish was supplied with water, the natural inference was that it was supplied by the only company which had power to do so.

Mr. PEARSON said that in 1870 the vestry wanted a better supply of water for the purposes of extinguishing fires, and then they applied to the Southwark Company, treating them as acting under the powers of the Richmond Company, and were only too thankful to get an extra supply of water from them. In 1873 the vestry seemed to think they might supply themselves with water, and accordingly they proposed to do so under the Act then in force, which was that of 1848. That Act contained the provision for giving notice, to which he had before referred, and it also restricted the supply of water to a quantity sufficient for the purposes of the Act, which, by section 76, was limited to this, that if any housekeeper refused to be supplied with water, the local authority might compel him to do so on a report of the surveyor, but at a rate not exceeding 2d. per week. That was totally different to what could be done under the Act of 1875, which did not contain the limit of the Act of 1848. As he had said, the Act of 1848 did not authorize the supplying of water in general for all the purposes of the inhabitants, public and private.

The VICE-CHANCELLOR thought the clause in the Act of 1875 was only a repetition of that in the Act of 1848.

Mr. PEARSON said the powers were considerably enlarged; under the former Act there was not the power to supply every house with water for private purposes or otherwise, but only for the purposes of the Act, and for private use to the extent required by the Act, and under the 76th section they could only enforce a rate of 2d. per week on an occupier if he would not supply himself with water otherwise.

Mr. GLASSE said the Act of 1858 extended that section.

Mr. PEARSON agreed that it did so to some extent, but not to the extent of the Act of 1875. The vestry now set up that the notice given in 1873 was a proper notice under the Act of 1875, but this was absurd. The answer was, that under the Acts of 1848 and 1858, the vestry were not authorized to do that which they could do under the Act of 1875; and, therefore, giving notice under the two former Acts was not the same as giving notice under the Act of 1875. However, having served that notice in 1873, they appealed to the Local Government Board for leave to raise £28,000 upon the security of the rates. The Southwark Company applied to be heard upon that application, and it was decided they should be heard. The certificate of the Local Government Board was not made until the 23rd of October, 1875, and it was to the effect that the board would sanction the loan, but that that consent would not prevent the necessity of the vestry satisfying themselves that they were legally empowered to construct the works. Therefore, the responsibility was thrown entirely on the vestry to see that they had legal power. On the 30th of October, advertisements were issued in the papers, inviting tenders for the construction of a reservoir in Richmond Park, which they seemed to think they had authority to do. On the 13th of November, 1875, Messrs. Bircham and Co., solicitors to the plaintiffs, wrote a letter to the vestry, calling their attention to the fact that the Richmond Water-Works Company were empowered to supply water to Richmond, and were able and willing to do so, and, under these circumstances, they must request the vestry would not proceed further with the proposed works until the provisions of the Act of 1875, with reference to notice and submission to arbitration, had been complied with. Some correspondence took place, the result of which was that the vestry insisted on going on, and, therefore, the plaintiffs were obliged to come to the court. The real question was, whether the Richmond Water-Works Company were now in existence, and still, by themselves or their agents, supplying Richmond with water.

The VICE-CHANCELLOR asked if the Act of Incorporation of the company contained any provision for its dissolution.

Mr. PEARSON said no. He contended that, if there were no new directors appointed, the old ones remained in office, *ex necessitate*, until new ones were elected.

Mr. GLASSE said this could not be so, because at the sale of their shares they ceased to hold the requisite qualification.

The VICE-CHANCELLOR thought the fair result of what had been stated was, that in 1861 the Richmond Water-Works Company handed over their business to the Southwark Company, who had continued the business. Then there was the rule *qui facit per alium facit per se*. He supposed they did not transfer their property in the pipes and mains.

Mr. PEARSON said they did—some of them. He then proceeded to read the provisional agreement made for the sale of the shares in the Richmond Water-Works Company to sixteen persons, members of the Southwark Company, who bought them. They were to act as trustees for the Southwark Company, and that was the reason the other company were made co-plaintiffs.

The VICE-CHANCELLOR said the question really was whether a company, which had virtually ceased to exist in one sense—namely, as a separate corporate company, carrying on its own business with its own directors, but which did the duty committed to it by the Act of Parliament through the agency of another company—was to be considered as an existing company. He thought it was a very ungracious objection on the part of the vestry. For fourteen years they had had a supply of water, and no one had suggested they had come to an end, while practically they knew the Southwark Company were supplying them with water. But now on a technical ground it was said the Richmond Water-Works Company did not supply the water.

Mr. PEARSON said the objection was not only ungracious, but unsubstantial.

The VICE-CHANCELLOR inquired if there were still any shareholders in the Richmond Water-Works Company?

Mr. PEARSON replied that there were. He had the names of the original transferees, some of whom were still alive, and the others had representatives or assignees. It could not alter their legal position that, for their own purposes, they chose to make an agreement with the Southwark Company, and say that, after a certain dividend had been declared in the Richmond Water-Works Company, they undertook to hand over to the Southwark Company all the rest of the dividends, to be divided amongst their shareholders. They had a right to deal with their dividend as they pleased. The deed of agreement having been referred to, he would call attention to the careful way in which the Richmond Water-Works Company were kept alive in that deed.

The VICE-CHANCELLOR asked which clause of it kept the company alive?

Mr. PEARSON said the whole of them. The shares were transferred to 16 people, who became *de facto* and *de jure* the Richmond Water-Works Company.

The VICE-CHANCELLOR asked if there had been any transfer of shares since 1861?

Mr. BEAUMONT: Yes, some very lately.

Mr. GLASSE: Before this suit or after?

Mr. PEARSON: Both before and after. He then went again through the terms of the deed, and contended that the whole effect of it was to keep alive the Richmond Water-Works Company.

The VICE-CHANCELLOR said he supposed the Southwark Company, if they chose, might cut off the supply of water, and the remedy of any aggrieved inhabitant would be against the Richmond Water-Works Company, and if they were defunct the penalties could not be enforced.

Mr. GLASSE said they had no power to compel the Southwark Company to supply them with water.

The VICE-CHANCELLOR said the argument appeared to be, that there was no privity whatever between the inhabitants of Richmond and the Southwark Company. They might cut off the mains, and bring the water straight up to Vauxhall, and the only remedy would be against the Richmond Water-Works Company, which Mr. Glasse contended was defunct.

Mr. PEARSON said they did not consider it defunct in 1873, when they gave them the notice.

The VICE-CHANCELLOR thought it was a case which ought to be arranged.

Mr. GLASSE said the real cause of the dispute was, that the company went to Parliament to obtain power to increase the water-rates, which was opposed by the vestry, including the gentleman who is now acting as solicitor for the plaintiff. The Richmond Water-Works Company were not within the terms of the Act of 1875, because though they might be willing to supply the water, they were not able.

Mr. PEARSON said that any question with regard to the sufficient supply of water was to be settled by arbitration. The vestry had been in constant communication with the company, seeking and getting favours from them. With regard to the supply coming from Hampton, that was an absurdity, because they were not bound to take it from any particular place.

The VICE-CHANCELLOR asked if they had power to sink an artesian well if they thought proper.

Mr. BEAUMONT said they had general powers to take land and a special power to take 10 acres from persons under disability. No one could contend that 10 acres was not sufficient to sink an artesian well.

Mr. GLASSE said that the whole of their works had been sold by the Southwark Company, and they had put the money into their own capital. The whole company was defunct, and this was an attempt to do, without the authority of Parliament, that which Parliament had refused. The question would be governed by the case of *The Great Northern Railway Company v. The Eastern Counties Railway Company*.

The VICE-CHANCELLOR here intimated that he was inclined to hear what the defendants had to say. He wished to know what injunction Mr. Pearson asked for.

Mr. PEARSON said he only required that the vestry should be compelled to give the notice provided for in the Act of 1875, and to go to arbitration, and that they be restrained from proceeding with their works until they had given such notice, following the words of the Act of Parliament.

Mr. BEAUMONT said he did not think it would be right to leave the case without adding a few words upon it. But he would first put in the evidence formally, which consisted of two affidavits by Mr. Joseph Quick, the first of which supported the statement of the claim, and the second replied to certain passages in the defence, which seemed more or less to call for reply. In these affidavits Mr. Quick said he was the engineer of the Richmond Water-Works Company, as well as of the Southwark Company. The only other affidavit was that of a clerk to Messrs. Bircham, verifying the correspondence. The whole question lay within a very small compass, and he thought it a very plain one, but still he felt that he ought not to leave the case entirely without comment. As Mr. Pearson had said, their claim was a very fair and modest one, merely that the vestry should not go on to the detriment of the plaintiffs until they had given a notice of a most innocent description, and if there was a difference between them, whether they were able and willing to supply the water required, it should be referred to arbitration in the terms of the Act of Parliament. This the vestry refused to do; they insisted on borrowing a large sum of money from a public body, and expending it, at the risk of the ratepayers, on a speculative undertaking, disregarding the rights of the plaintiffs and their own duties by engaging in this speculative water-works for supplying the water in a new and altogether uncertain mode.

The VICE-CHANCELLOR asked if there had been complaints of the quantity or quality of the water.

Mr. BEAUMONT said there had been some few; but according to Mr. Quick's evidence, whenever they had been made, they had been attended to. The company were subject to the provisions of the Metropolis Water Supply Act, which were much more stringent than those of any other Act referring to water companies, and Mr. Quick stated upon his oath that the Southwark Company did supply water far superior to any water which could be supplied by an undertaking carried on by the defendants. However, that question seemed to him outside the case. All that they asked was to refer these questions to arbitration, and his contention was that, on the words of the statute, the Richmond Water-Works Company were entitled to the benefit of the protection therein contained.

The VICE-CHANCELLOR: Would they not have a right to revive, even if they were defunct?

Mr. BEAUMONT said he was not in the least degree afraid of the argument that they were defunct. Until it was proved to the contrary, a company constituted by Act of Parliament continued for ever; in fact, there were no means of putting an end to it, except by Act of Parliament.

The VICE-CHANCELLOR: Suppose they had agreed with the Southwark Company that they should supply the water, and receive five-sixths of the water-rates, what illegality would there be in that?

Mr. BEAUMONT: None at all. But if it were illegal, how would it have affected their existence. His first point was the *status* of the company as to its existence; it could only be put an end to by Act of Parliament, and this point he believed was not arguable.

The VICE-CHANCELLOR asked what there was to prevent drawing water from the Thames at Richmond now.

Mr. BEAUMONT said, when they ceased to draw water from that place, they sold the land, and, therefore, at that particular spot, they would have to buy it back again.

Mr. GLASSE said the evidence was that the land was sold by the Southwark Company.

Mr. BEAUMONT controverted this statement, and said it was sold for the Southwark Company's account, in accordance with the stipulations of the agreement of 1861. If it were true, as Mr. Glasse contended, that the Richmond Water-Works Company had ceased to exist, he might rely on the argument suggested by his lordship, that the Southwark Company might shut off the supply to-morrow.

The VICE-CHANCELLOR said he did not see why they were not at liberty that very evening to cut off the supply of water to Richmond altogether, according to the argument of the defendants.

Mr. GLASSE said if they chose to do so, they could obtain a supply within a couple of hours.

Mr. BEAUMONT, continuing his argument, said the defence was, apart from the main statement that the plaintiffs ceased to exist, that their irregularities of conduct had been such as to warrant their being disregarded, and they went into certain questions about the directors being elected, and so on. All this, he contended, was beside the question. If a man broke all the Ten Commandments and every Act of Parliament, that did not deprive him of his personal rights; and whatever irregularities the Richmond Water-Works Company might have committed, that did not prevent them asserting their rights in a matter which had no direct connexion with those irregularities. For many purposes *de facto* directors were as good as any others. In the case of *Scadding v. Lorent*, in the House of Lords, it had been held unanimously by the judges to whom the question was submitted, that vestrymen *de facto* were as competent to join in making a rate as vestrymen *de jure*, and in the County Assurance Company's case, in the 5th Chancery, Vice-Chancellor Giffard decided that a policy of insurance could not be impugned on the ground that some of the directors who had signed it were not properly appointed.

The VICE-CHANCELLOR said the parish of Richmond had been supplied with water for 40 years, and the plaintiff company was the only body authorized to do it.

Mr. BEAUMONT said there was another company entitled to do so, but they declined. Their mains passed through the parish, but they had no service-pipes laid on.

The VICE-CHANCELLOR asked what the artesian well was wanted for.

Mr. BEAUMONT said he did not know. If they got water, it would be from the chalk, and it was well known what diseases were caused by drinking such water.

Mr. GLASSE said that was all moonshine. There was very good water at Brighton from the chalk.

The VICE-CHANCELLOR remarked that ladies said the water at Brighton was very hard; and he found when at Brighton he could not get a good lather to shave with. However, water was a subject he never liked to inquire too much about. He thought he was now in possession of the plaintiffs view of the case, which did not seem to call for any lengthened argument.

Mr. BEAUMONT said if his lordship stopped him, he should be very happy to sit down; but, unless he had that advantage, he did not feel justified in leaving the case without dealing with all the points put forward by the other side. He then cited the case of *The Shrewsbury and Birmingham Railway Company*, reported in 2 De Gex, Macnaghten, and Gordon, and the case of *Stace v. Worth*, 4 Chancery Appeals, which held that a liability contracted upon the faith of an amalgamation which was supposed to have taken place, did not attach, inasmuch as the amalgamation, upon the faith of which it was entered into, had not been effectually carried out. Now, the deed of agreement which had been read showed plainly that the object was not amalgamation, but to keep the Richmond Water-Works Company alive; but even if there had been an attempt at amalgamation, it would not have been effectual, and, therefore, the status would remain the same. The Richmond Company were, therefore, in existence, which was enough for his purpose, quite apart from the question whether they were still supplying water. They were perfectly willing and able to supply water which was all the Act required. He then referred to the notice given in 1873, which was quite insufficient to meet the requirements of the Act of last session, being given under another Act, and for a different purpose; and proceeded to cite cases, showing that a notice to quit was inoperative if not in proper form, even although the informality was in favour of the party to whom it was given.

The VICE-CHANCELLOR did not think these cases had much bearing on the present question. Why had not the plaintiffs applied earlier?

Mr. BEAUMONT said the vestry had done nothing of which they could complain, until they advertised for tenders to construct the works.

Mr. GLASSE: You appeared before the Local Government Board, and opposed our application.

Mr. BEAUMONT said that was the Southwark Company, not the Richmond Water-Works Company; and the Local Government Board expressly left it to the vestry to determine whether they were legally entitled to act as was proposed or not. The Southwark Company were joined as co-plaintiffs for this reason—that, when the shares were sold in 1861, the interests of the two companies became identical, and that was why the notices and receipts had been issued in the name of the Southwark Company. The vestry had dealt with the latter company on the footing that they were exercising the powers of the Richmond Company. For instance, the Richmond Company was the only one which had the power to break up the roads, and it was well known how vigilant the vestry were in the matter of the public roads, even interfering with the highest personages who they considered invaded their rights in this matter; and yet the Southwark Company had constantly opened the roads, without the consent of the vestry. He believed there was an objection once taken, but that was because the notice given was not in strict accordance with the terms of the Water-Works Act. Even then no leave was asked.

Mr. GLASSE said he had some 25 instances proved, in which leave was asked.

Mr. BEAUMONT believed he was strictly accurate, and that what Mr. Glasse referred to was the instance he had mentioned, in which the requisite three days notice had not been given.

The notice being handed up to the Bench,

The VICE-CHANCELLOR said the notice, on the face of it, was clearly given by the Southwark Company. No doubt it might have been objected to, but the only result would have been that it would have been withdrawn, and another issued in the name of the Richmond Water-Works Company. The learned counsel for the plaintiffs had stated their case very clearly, though they had taken four hours to do it. He should now like to hear what the other side had to say.

Mr. MICHAEL said he was with his learned friends, but he did not desire to add anything to the argument.

Mr. GLASSE, for the defendants, said: In the session of 1861 the Southwark and Vauxhall Water-Works Company applied to Parliament for an Act to authorize the transfer to them of the Richmond Water-Works, and to that Act was appended a schedule of the agreements with the Richmond Water-Works Company. That bill was opposed by the Vestry of Richmond, and upon its coming before a committee of the House of Lords, it was withdrawn, upon an intimation of the committee, upon the ground that the Southwark and Vauxhall refused to adopt the West Middlesex scale of charges. The first schedule contained the agreement between the Richmond Water-Works Company and the Southwark and Vauxhall Company, but before he read the terms of that agreement, he would refer to the foundation of the law upon which he proceeded.

Having withdrawn that bill, they then proposed to make the agreement upon which they now relied, in order to do indirectly that which the Legislature had refused to sanction, and he submitted that where it was against public policy, they could not come and ask the court to interfere. That point was neatly determined by Lord Justice Turner, in the case of *The Great Northern Railway v. The Eastern Counties Railway Company*, reported in 9 Hare, 306. All the shares of the Richmond Company had been sold to, and vested in, the Vauxhall Company. There had been no separate existence from the year 1860 of the Richmond Company, but it was now raked up for a purpose which his lordship had not yet heard. The title of the agreement in the bill of 1861 was for authorizing the transfer of the Richmond Company to the Southwark and Vauxhall Company, and for extending the limits within which the Southwark and Vauxhall Company might supply water, and for other purposes; and it recited the territorial limits of the Southwark Company. Section 41, of the Act of 1852, described the territorial limits within which the company should supply water, and his lordship would see that, although several parishes were mentioned, Richmond was not included.

The VICE-CHANCELLOR said that had been conceded by Mr. Pearson.

Mr. GLASSE said if that were so, the whole thing was *ultra vires*. They had no right to apply the company's moneys in supplying Richmond with water; they could not do it by arrangement or by agreement with any one else, and they could not apply the moneys of their own shareholders, except in the territorial limits within which they were confined. The agreement was to be subject to receiving the sanction of Parliament; it was to vest in the Southwark and Vauxhall Company all the property of the Richmond Company, the Richmond Company was to cease and discontinue the supply from Michaelmas; in the meantime, the Richmond Company were to carry on the business at their own expense; if they obtained the assent, certain things were to be done, and they were to keep accounts and vouchers. Then there were certain clauses which were to be operative, even if Parliament did not give them. If the proposed Act were not obtained before Michaelmas, 1863, the Southwark and Vauxhall Company were to be empowered to supply water, and on being required by the Richmond Company were to pay them £16,500 with interest at 7 per cent. Upon each payment the Richmond Company were to grant and transfer to the Southwark and Vauxhall Company all such plant as they could lawfully sell and transfer, including freehold lands, wells, &c., but not including books, money, and so on. Having failed to get this through Parliament, they now resorted to the expedient of applying to his lordship, which he (the learned counsel) submitted was utterly *ultra vires* the company, and was against public policy. Let them consider whether it was a lawful thing to do, and whether it was not against public policy. In the Richmond Water Company's Act there was a provision, that the qualification of a director should cease if he did not attend a certain number of meetings, and have a residence in Richmond, and his lordship would see that the parties to the agreement did not live at Richmond.

Mr. PEARSON said they might have a residence in Richmond as well as their other residence.

Mr. GLASSE said they were not so described. The recital stated that a contract, subject to the sanction of Parliament, had lately been entered into between the two companies, for sale and purchase for the sum of £16,500; that the contract had not yet received such sanction; that several persons, called the shareholders, had purchased, for the aggregate sum of £16,500, the whole of the shares of the Richmond Water-Works, and that the purchase of those shares was made by and for all the shareholders equally, and that every shareholder was a registered owner of twelve shares. Then they covenanted that every shareholder should be possessed or interested in the twelve shares of which he was the registered owner, upon trust to give effect to the several provisions of the agreement, and that the profits of the Richmond Company, from time to time divisible among the shareholders of that company, should be applied in the first instance in the payment of 5 per cent. per annum upon the £16,500, or so much as was not paid off as thereinafter provided for, and that the payment should be made by way of rateable dividend, and then it stated what the dividend was to be. Then if and whenever the profits of the Richmond Company, applicable for the payment of dividend, were insufficient for the payment in full, the deficiency should be made up from subsequent half years. Then, except only as before provided, the shareholders were not to be beneficially entitled to any of the profits of the Richmond shares from time to time divisible among the shareholders of that company, but the whole of the profits, subject to and after payment of the dividend, should, at the option of the Southwark and Vauxhall Company, either be paid to them, or be applied in the manner afterwards provided for. If and whenever any surplus of those profits, or any other sum at the disposal of the Southwark and Vauxhall Company was so applicable, the same or any part thereof should, when the company thought fit, be applied towards paying off the £16,500, the purchase-money for the shares, so that that was to come out of the assets of the Vauxhall Company. If and whenever any sum of money was received by the Richmond Company as purchase-money for any of the lands, works, or property on capital account, the same, or so much thereof as should be divisible among the shareholders of the Richmond Company, should be applied towards paying off the £16,500. He would prove, out of their own mouth, that every scrap of land and property belonging to the Richmond Company had been sold, and that the produce thereof had found its way into the general amalgamated assets of the Southwark Company. The agreement went on to state that the several holders of the shares, in respect of which payments were to be so made, would be bound to accept the sum so paid; and that their executors, administrators, and assigns should not be entitled to receive, on account of purchase-money, any sum exceeding £137 10s. per share. When the £137 10s. per share was paid in manner provided for, the share, for the purposes of those presents, should be deemed to be paid off. It was now said that that had long since happened, and that the shares had been satisfied. The 15th clause of the agreement stated that the shareholders would, from time to time, execute all such reasonable acts, deeds, and so on, as should, from time to time, be required for giving full effect to the indenture, which was to secure to the shareholders the repayment of the purchase-money of £16,500, with interest; and, subject thereto, to secure that the Southwark and Vauxhall Company were to have, for their own use and benefit, or at their own disposal, all the profits and moneys of the Richmond Water-Works Company, from time to time, should be made divisible among their shares. That was utterly *ultra vires*. At the present time, the Southwark and Vauxhall Company were actually promoting a bill in Parliament, to give them power to do the very thing for which they brought the present action. In 1865 they again tried their hand in Parliament, and failed.

The VICE-CHANCELLOR said he understood the defendants to say that that was an attempt to do that which Parliament had not sanctioned, and that being an attempt to carry into effect an illegal arrangement, the court could not interfere.

Mr. GLASSE: Just so. In 1865 they promoted a bill before Parliament to enable them to extend their territorial limits to Richmond, in which bill they never referred at all to the existence of the defunct Richmond Company; and in that attempt they failed upon the same ground as previously, the Richmond Vestry declining to be saddled with the exorbitant charges of the Southwark and Vauxhall Company and the insufficient and bad supply of water. Then in 1876 they endeavoured to effect a resurrection of the long drowned and dead Richmond Company, and were trying to get an amalgamation of the two companies.

The VICE-CHANCELLOR said he thought the way would be to let the motion stand over for the plaintiffs to try their hand in Parliament.

Mr. GLASSE said he did not object, as he should oppose them there.

The VICE-CHANCELLOR said if they got parliamentary power they would not require his aid.

Mr. PEARSON said his lordship would understand that his friend was telling him one thing, and they were doing another. His friend was opposing the Richmond Company, but the company going to Parliament was the Southwark Company; they were two distinct companies.

The VICE-CHANCELLOR said they were two companies most intimately associated.

Mr. GLASSE said they were joined as co-plaintiffs; it was an ingenious attempt, but very transparent.

Mr. PEARSON said he had never heard of an amalgamation of two companies being effected, by simply making them co-plaintiffs in a bill in Chancery.

Mr. GLASSE said he was not at present opposing the Richmond Company, but opposing the plaintiffs.

The VICE-CHANCELLOR thought the motion should stand over, as they were applying to Parliament. If the bill passed, they would attain their object; and if the bill were rejected, he did not think he ought to interfere.

Mr. PEARSON desired to be heard upon that. He might withdraw the bill to-morrow.

Mr. GLASSE: Will you withdraw it?

Mr. PEARSON said he could have two strings to his bow.

Mr. GLASSE replied that he could not play upon them both at the same time.

Mr. PEARSON said, if the bill were thrown out of the House, he should still have a right to an injunction.

The VICE-CHANCELLOR said they had tried it several times, and he thought it ought to depend upon the result of the bill. If they had not come to the court, no doubt it would have been said that they had stood by and let the works proceed; but the effect of the bill being filed, and standing over, would guard them against that. He did not think he could grant an injunction.

Mr. GLASSE said he was willing to give an interim order, or undertaking not to proceed, the plaintiffs being answerable, in the meantime, in damages.

The VICE-CHANCELLOR said in any view of the case they must be answerable in damages.

Mr. PEARSON desired to be heard upon the point.

Mr. GLASSE said he offered an injunction till after they had tried their hand in Parliament.

The VICE-CHANCELLOR said the defendants were willing to submit to an injunction upon the plaintiffs undertaking to be answerable in damages, and he could not give an order on any other terms.

Mr. PEARSON said if he had an injunction until the hearing, he should be answerable in damages; but an injunction until the House of Lords and House of Commons had sat upon the bill, he did not understand.

Mr. GLASSE said he would put it in another form—an injunction until further order; the motion to stand over until the fate of the application to Parliament was determined.

The VICE-CHANCELLOR said he was not inclined to interfere in favour of the plaintiffs pending the bill in Parliament.

Mr. PEARSON said in that case he should not require to call his lordship's attention to the bill, because it could not affect the question.

The VICE-CHANCELLOR thought the offer made by Mr. Glasse was a very liberal one.

Mr. GLASSE said he must withdraw the offer as to an injunction altogether as they had declined it, and he would not repeat it.

The VICE-CHANCELLOR felt inclined to simply order the motion to stand over until the result of the bill was known; then there would be no undertaking, and the defeedants would go on at their own peril.

Mr. PEARSON said if it were necessary to go into the question of the bill in Parliament he should wish to consult his clients upon it.

After a brief interval, during which another motion was disposed of

The VICE-CHANCELLOR asked Mr. Pearson if he had made up his mind.

Mr. PEARSON said he should like to have time to consult his clients about it, which he could do before next motion day.

The VICE-CHANCELLOR said he thought the best way would be to make an order for the motion to stand over until the result of the bill before Parliament was known.

Mr. PEARSON said possibly his clients might not object to that; but he should wish to consult them.

The VICE-CHANCELLOR said it was still a very doubtful point whether the Southwark Water-Works Company had power to supply Richmond with water; but that doubt would be removed by the passing of the bill. Then they would come within the 52nd section, and might be in a situation to succeed on the motion.

Mr. PEARSON said that then they would be told that they were too late.

The VICE-CHANCELLOR: Not as far as I am concerned.

Mr. PEARSON said he must be heard upon that point.

The VICE-CHANCELLOR said the argument must take place immediately, then, for he could not have all the other business of the court interfered with. [It was then twenty minutes to five o'clock.]

Mr. PEARSON said he should have to reply upon all the cases which had been cited.

The VICE-CHANCELLOR said only one case had been cited—the *Great Northern Railway Company v. The Eastern Counties Railway Company*—which decided that it was no use attempting to do something indirectly, which the Legislature had refused to allow to be done directly. The question was, whether it applied to the present case.

Mr. PEARSON said that was exactly what he wished to disabuse his lordship's mind of.

The VICE-CHANCELLOR thought it was not the right course to be going on with two proceedings at the same time—the motion before him, and the application to Parliament.

Mr. PEARSON said the two matters were absolutely distinct. If the bill were passed, it would not interfere with the vestry, if they had power under the Act of 1875, constructing water-works; and borrowing £28,000 on the rates, would enable them to do it. If to-morrow the Southwark Company obtained the powers which the Richmond Company had to-day, that could not prevent the power of the Richmond Vestry to proceed under the Act of 1875. If at the present moment both the Richmond and the Southwark Companies had powers to supply Richmond with water then the vestry were bound to give notice to them both, before they could put the Act in force. But if the contention on the other side were correct, that the Southwark Company, under their Act, had no power to supply Richmond, and that it had not been necessary to give the Southwark Company notice of what they were proposing to do, then the passing of an Act to-morrow by the Legislature, authorizing the Southwark Company to buy up the Richmond Company, or to supply Richmond with water without buying them up, could not interfere in any way with the power of the vestry to proceed under the Act of 1875; the two powers would be perfectly concurrent, and if the Southwark Company then came to this court and sought to restrain the vestry from proceeding under the Act of 1875, because they had then got what they had not at the beginning of the year, a power to supply Richmond with water, the answer would be "You are coming too late. Before you had the power to supply Richmond with water the vestry had taken proceedings in order to supply themselves, and at the time they initiated those proceedings you were not entitled to have notice served on you. Therefore the vestry are not bound to serve it on you now." For this reason he

could not conceive what the passing of the bill could have to do with the question before the court.

The VICE-CHANCELLOR said Mr. Glasse had offered to submit to an injunction if the plaintiff would be answerable in damages.

Mr. PEARSON was willing to accept an injunction until further order.

Mr. GLASSE said his first offer was made without instructions, and it was only an injunction until the bill was disposed of. That had been refused, and he could not repeat it.

Mr. PEARSON having continued some time to comment on the case cited, and to refer again to the agreement,

The VICE-CHANCELLOR said he had already heard that three times. He thought the best way would be for him to state his views upon the case, and if Mr. Pearson were not satisfied with him, he could take it elsewhere. If he wished to make any observation upon it, he would hear him afterwards.

Mr. Pearson having sat down, his LORDSHIP commenced to deliver judgment.

Mr. PEARSON again rose, and said he did not understand that his lordship was going to give judgment on the motion, but simply to explain the view he took.

The VICE-CHANCELLOR said he was going to state why he did not think he could give the plaintiff any injunction.

Mr. PEARSON said he must be allowed to argue the case before his lordship gave judgment.

The VICE-CHANCELLOR: Then I will sit and hear you until midnight.

Mr. PEARSON said nothing was more inconvenient than breaking through the ordinary rule of the court, that it should rise at four o'clock.

The VICE-CHANCELLOR said if the case were not disposed of now it would occupy the whole of next motion day. He thought the order he was about to make would afford ample protection to the plaintiffs.

Mr. PEARSON said he did not think so.

After a little more discussion, Mr. Pearson, on an intimation from his client, resumed his seat, and said he would not argue the question any further.

The VICE-CHANCELLOR, in delivering judgment, said this was a motion by the Richmond Water-Works Company and the Southwark and Vauxhall Water-Works Company against the vestry of the parish of Richmond, and the object of it was to obtain an injunction against the vestry of the parish of Richmond, restraining them from immediately proceeding to construct water-works in the parish of Richmond. The general object was to prevent the vestry constructing works for supplying the parish with water, on the ground that the Richmond Water-Works Company, the first-named plaintiff, had already the power of supplying that parish with water, which could only be interfered with upon the conditions imposed by the Public Health Act of 1875; which, in effect, was, that if there were a company able and willing to supply the parish or district with water, the new association or company cannot be formed for the purpose without certain things being done, giving them first an opportunity of going to arbitration. It was said the Richmond Water-Works Company were now supplying the parish, and the vestry and the parish were setting up new water-works which would have the effect of destroying all the interest of the existing water-works, and would be most disastrous to them. It appeared to him from the whole argument that if the Richmond Water-Works Company were an existing company, possessing the powers conferred upon them by Act of Parliament passed in 1835, for supplying the parish with water, then they were entitled to succeed upon the motion. But against that, it was said that the Richmond Water-Works Company were no longer in existence. They applied to Parliament in 1861 for authority to transfer their powers to the other company—the Southwark and Vauxhall Water-Works Company. That bill was rejected by Parliament; but, on the 20th of February, 1862, which was shortly after, a contract was entered into, fully set out in the answer to the statement of claim, by which it appeared that it was agreed that every shareholder in the Richmond Water-Works Company was to transfer his shares to persons who were to hold them in trust for the Southwark Company, and thus there was an attempt to do that indirectly which the Legislature had refused to authorize to be done directly. If that were so, then he thought the case did fall within the case of *The Great Northern Railway Company v. The Eastern Counties Railway Company*, as being against public policy—that powers given to one company should be transferred to another—and on that ground very likely the plaintiffs would ultimately fail. However, after he had heard the learned counsel in support of the plaintiffs for no less than four hours, it came out, for the first time, upon Mr. Glasse's statement for the defendants, that this very company—the Southwark and Vauxhall Company and the Richmond Company, for he must take them as acting together—had now a bill pending in this very session of Parliament, which proposed, amongst other things, to transfer all the powers of the Richmond Company to the Southwark and Vauxhall Company. Now, if that bill became law, it would then be perfectly clear that there would be an existing company having the power to supply the Richmond district with water, and that would bring the case within the provisions of the 52nd section of the Public Health Act, 1875. If, on the other hand, the bill should not pass, then matters would stand much as they did now, and the court would ultimately have to decide whether the powers of the Richmond Company were or were not in force. If the court should come to the conclusion that they were not in force, then the motion would fail, because it was admitted by everybody that the Southwark and Vauxhall Company, as such, had no legal authority whatever in the parish of Richmond, and therefore, if the Richmond Water-Works Company had no power, then it followed that there was no company which had the power of supplying the parish with water, and thus the case would be taken out of the 52nd section, and the motion would necessarily fail. He did not think it right that while the plaintiffs in this suit were promoting a bill—which Mr. Pearson said could be withdrawn at any moment, but, until they did withdraw it, he must consider they were promoting it, which it would be totally unnecessary for them to promote if they were so clearly satisfied, as Mr. Pearson and Mr. Beaumont had represented themselves to be, that all the powers of the Richmond Water-Works Company were now in full force—they should move for this injunction. If all these powers were in force, what did they want an Act of Parliament for, because they could now, by virtue of the powers of the Act of 1835, do everything which they could by the proposed bill. Therefore, it seemed to him to show that there was great doubt on the part of the plaintiffs whether they had those legal powers which they had so strenuously urged upon him they did possess. If he granted an injunction at this time, he should be arming them with power which he thought they ought not to be armed with at present, unless by consent. But, on the other hand, what harm could be done by his refusing the injunction, and ordering the motion to stand over until further order, his meaning being that it should stand over until the result of the application to Parliament was known. He was morally satisfied that the defendants, the vestry, would not, pending that bill, proceed to execute their works, which were of a very expensive character. If it should turn out that the bill did not pass, then the position of things would be this. Here was an action in the Chancery Division, commenced on the 30th of November, claiming that the powers of the Richmond Company were in full force, and asking an injunction on that ground. They either were in force or they were not. If they were not in force, the motion ought now to fail, and would do so ultimately; if, on the other hand, they were in force, then what was the necessity for promoting the bill in Parliament to confer on the Southwark Company all the rights which they contended were still in existence. He should simply order the motion to stand over until further order, in order that it might be seen what was the result of the application to Parliament. If the plaintiffs made up their mind to withdraw the bill, then they would be immediately at liberty to resume the motion. He had already heard the arguments of the plaintiffs pretty fully, and it would be for Mr. Glasse to resume his argument for the defence. If they went on with the bill then, until it was either rejected or withdrawn, he must order the motion to stand over; and taking that course, he considered he was having due regard to the interests of both parties, because he did not see, in such a state of things, that it was right he should grant an injunction. It would cause no inconvenience, because it did not put the plaintiffs in the very serious position of having to give an undertaking to be answerable in damages which might be very serious to them, and he was satisfied that, until Parliament had decided one way or the other, the defendants would not go on with their works.

Mr. GLASSE said he understood the order was—the motion to stand over until futher order, with an expression of his lordship's opinion that it meant until the result of the application to Parliament was known, with liberty to either party to apply.

The VICE-CHANCELLOR said that was his meaning.

Mr. BEAUMONT: That will be without prejudice.

The VICE-CHANCELLOR: Without prejudice to any question, and liberty to apply. You may put it until further order, but I mean until the bill is disposed of by Parliament or withdrawn by the promoters.

COURT OF APPEAL FROM INFERIOR COURTS.—SATURDAY, FEB. 5.

(Before Baron CLEASBY *and Justice* FIELD.)

THE MAYOR AND CORPORATION OF WORCESTER, *Appellants*, *v.* THE ASSESSMENT COMMITTEE OF THE DROITWICH UNION, *Respondents*.

ASSESSMENT OF CORPORATION WATER-WORKS.

Mr. DOWDESWELL, Q.C., and Mr. CASSELL appeared to support the appeal; Mr. H. MATTHEWS, Q.C., and Mr. JELF for the respondents.

Mr. DOWDESWELL said this was an appeal, the facts being stated on a special case, by order of Justice Blackburn. The appellants were the Council and Local Board of Health of the city of Worcester, and the respondents were the Assessment Committee of the Droitwich Union, in which the whole of the parish of Claines was situated, partly in the city and partly in the county of Worcester. In the year 1849 the Public Health Act was applied to the city of Worcester, and in 1856 the appellants, in pursuance of the powers of the statute, purchased certain lands in the parish of Claines, within the city, but for poor-law purposes separated from the city of Worcester. The appellants erected thereon water-works, at a cost of £30,000, including £2076 for the purchase of the land. The appellants fixed certain rates for the water, and a scale for those who consumed by meter. The appellants did not erect those works so much for profit or commercial speculation, as by way of a sanitary arrangement, the prices charged leaving little above the cost of the supply. The price they charged was only 4d. in the pound rental; but if the house was under the annual value of £8, then the rate was only 3d. in the pound; and in some cases it was only 2d. in the pound. The meter scale was 3d. per 1000 gallons on a large consumption, and up to 7d. per 1000 gallons when the consumption was less than 200,000 gallons per quarter. The real point was, whether this sanitary authority was to be treated as a commercial body, carrying on business for their own profit; but they carried on the works for purposes of great public utility, confided to them under the Public Health Act. The appellants contended that the provisions of that Act contained the only authority for their charging a water-rate. Such a rate only was authorized as would reasonably defray the expenses of supply; and there was no authority by the Act to receive any more from the consumers than would do that. The respondents contended that it was right to rate the appellants in respect of the water-works at what a tenant would give, with liberty to raise the price of water as he might think proper, so far as he was not restricted by law; that in the present case there were no restrictions by law; that although the appellants only looked to the benefit of the inhabitant ratepayers of Worcester, yet this only shifted the benefit from the Corporation to the ratepayers, for whom they were the trustees, and that it was unfair that inhabitants of the city should enjoy this at the expense of the inhabitants of the rest of the parish of Claines. The learned counsel, in support of the appeal, said the question raised was one of great public importance, for the inhabitants of towns and country places alike should have a sufficient supply of wholesome water secured to them; and instead of permitting that supply to be dependent upon the caprice and pecuniary interests of bodies of proprietors, Parliament had enabled public bodies, as the guardians of the public health, to acquire this species of property. He referred to the objects of the Act, which were to supply water for domestic and manufacturing purposes, for public baths, and for watering the streets, &c. The basis for rating was not what a person possibly could derive, but what he actually did derive from the undertaking.

Baron CLEASBY: To what extent are the appellants restricted in the enjoyment of the profits, except so far as being limited to a certain rate?

Mr. DOWDESWELL said that the only rate or remuneration for which they could make any claim was that which related to domestic or manufacturing use. They could not receive one farthing except for those purposes.

Baron CLEASBY pointed out that they were not restrained as to any contract with a trade, and in that there was an element of profit.

Mr. DOWDESWELL would not deny that the Corporation would be chargeable in respect of such a contract, but they could not be charged where they had entered into no such contract. It was also to be remembered that they could not charge for water used for public purposes, such as watering the streets, extinguishing fires, and general sanitary purposes.

Mr. MATTHEWS: You levy a district rate for that.

Mr. DOWDESWELL did not see that that could come into the calculation. It could not be said that the Corporation, acting for the public health, should stand in the same position as traders for their individual benefit.

Mr. MATTHEWS said the appellants had charged less than they had power to charge by way of water-rate, and they contended that they should only be rated on their actual water-rents. But the argument of Mr. Dowdeswell would go to the length of saying that such water-works should not be rated at all; for if they were only to levy as much as would defray the expenses of supply, there would be no rateable margin. The construction of the works was met by a district rate, and was not liable to be deducted from those rents. There was no reason why the rest of the Droitwich Union was to be rated more heavily to meet the gratuitous supply with water of those in the city of Worcester. The learned counsel then cited various cases in support of his argument.

Baron CLEASBY: Do you contend that if the Act restricted them to a water-rate of twopence in the pound you could rate them higher than that, because in the hands of a tenant of such water-works it would have enabled them to raise sixpence in the pound?

Mr. MATTHEWS said that if the water-rate was avowedly based on the rents, and there was a statutory enactment that the limit was to be so much, they would not assume that the hypothetical tenant would or could levy higher rates. It would be like a farm, the produce of which was limited to a certain kind of produce. A man who used his land as a park, for the purposes of recreation, was rated on the same basis as if the land was used for agricultural purposes, although he really derived no profit from it. In the present case the appellants claimed to be rated only on £600, which was their actual water-rent.

Mr. DOWDESWELL having replied,

The Court reserved judgment.

FRIDAY, FEB. 11.

Baron CLEASBY this day delivered the judgment of the court. He said: I have not disputed that the appellants were liable to be rated in respect of water-works erected and occupied by them. The question was whether the rateable

value was to be measured by the profits actually derived from the rateable occupation, or the profits which might have been derived. The fact was that the Corporation, having in view the benefit of the inhabitants of the city, made a water-rate, leaving a profit only of £600 actually received after deducting the expenses of management, collecting, &c. The respondents contended that a trading company might have realized a much larger amount, which amount ought to be the basis of the assessment; but that position could not be maintained, for it was a mere hypothesis to treat the Corporation as a trading company. They were a public body, exercising their powers properly for the benefit of the inhabitants, and making their rates *bonâ fide* for that purpose, and having their powers under the Public Health Act. It would be strange to rate them in respect to property which they did not enjoy. It appeared, therefore, to the court that the contention of the appellants was right, and as £600 represented the gross estimated value, it ought to stand at that amount, and the rateable value at £540. The judgment, therefore, would be for the appellants.

On the application of Mr. JELF, who appeared as counsel for the respondents, their lordships gave leave to appeal, provided that were done with all despatch, and also, that in giving this leave, it was not to be understood that the court entertained any doubt on the matter.

QUEEN'S BENCH DIVISION.—MONDAY, JAN. 24.

(Sittings in Banco, before Justices BLACKBURN, LUSH, *and* QUAIN.)

TARRY *v.* ASHTON.

In this case an action had been brought by the plaintiff to recover damages for the defendant's negligence, and a verdict had been obtained in his favour. Upon this a rule for a nonsuit, or to enter the verdict for the defendant, had been obtained.

Mr. M'INTYRE and Mr. DORLING appeared in support of the rule; and Mr. COLLINS and Mr. POULTER to show cause against it.

The defendant was the occupier of premises from which a lamp projected, overhanging the foot-pavement in the street, and a few months previous to the accident, he had employed a gas-fitter to repair and put in order the lamp. On the day of the accident one of his servants, by his direction and in his presence, placed a ladder against the lamp-bracket, for the purpose of cleaning it. The wind caused the ladder to slip, and the consequent shaking caused the lamp, which was suspended by a ball and socket-joint, and weighed upwards of 30 lbs., to fall. In its fall it injured the plaintiff, who was passing underneath. On the trial the jury found that the lamp was out of repair, from general decay; that if it had been in proper repair, the slipping of the ladder would not have caused it to fall, but that it would not have fallen at that moment if it had not been for the ladder slipping. They also found negligence in the gas-fitter employed by the defendant.

After hearing the arguments, the COURT discharged the rule, holding that there was a duty on the defendant, as occupier of the premises, to keep the lamp in repair, so as not to be dangerous to the public; and that he could not shift the liability arising from this obligation from himself by having employed a competent person to do the necessary repairs, that person having, in fact, failed to do them.

(Sittings at Nisi Prius at Guildhall, before the LORD CHIEF JUSTICE *and a Special Jury.)*

THE EUPION GAS COMPANY.

PROSECUTION OF THE DIRECTORS.

The trial of this case, which commenced on the 3rd inst., has occupied the court during the whole of the past week, with the exception of Tuesday. The case for the prosecution, which was completed on Saturday, is that the company was got up, by means of a pretended allotment of shares and pretended payment of deposits, to impose on the Stock-Exchange, not a single share being really taken or allotted or paid for, and that then the shares, being all in the hands of the defendants, or some of them, brokers, by means of pretended purchases of shares, were induced to enter into contracts for sales of shares at enhanced prices, with the object of ultimately compelling them to pay to the defendants the large sums of money they would have to pay as premiums in order to obtain the shares, for the delivery of which they were responsible. On Monday the evidence of stockbrokers, who alleged that they were defrauded in this way, was taken at great length, but the "operations" detailed by them are not of that special interest to require reporting in this JOURNAL.

On Wednesday the principal witness examined was Mr. *John Gamgee*, who was a professor of veterinary surgery, and subsequently became a financial agent. He stated that he was consulted by the defendant *Muir*, and requested to sell 15,000 Eupion shares, to be delivered in small lots within six months. The witness caused nearly half that number to be sold at various premiums, but as he could not get them delivered he declined to sell more. He now said he had been entirely ruined by the transaction. Evidence was also given as to the sale of shares through other parties, and it was elicited in cross-examination that a successful "bear" transaction was irrespective of delivery, and was done to obtain the difference in prices.

On Thursday the prosecution proceeded to show the effect of the transactions that had taken place with various brokers, the result being that, as the shares could not be delivered, differences of considerable amount had to be paid. Mr. Fielding had to pay £3183 on one settlement alone. One of the principal witnesses was Mr. *J. A. Hankey*, a stockbroker, who is also one of the prosecutors. Both he and others gave explanations of certain practices as to "making a market" for shares in a new company, which elicited from the Lord Chief Justice the remark that it was a fraud to resort to factitious and fictitious means in order to induce the public to invest.

On Friday, Mr. *Richardson*, the chairman of the Midland Banking Company, was cross-examined, and stated that no member of the board knew of the defendant Aspinall's large discounts. He knew nothing of the transactions until the evening before the defendants appeared at the Mansion House. He had no idea that the Midland Bank was financing the Eupion Gas Company. When the state of affairs was made known, Mr. Charles Knocker, the general manager, was requested to absent himself from the bank until he received notice from the board, and a few days later he was dismissed. The evidence of other stockbrokers, a clerk in the company, and of the provisional liquidator followed, and, with the production of certain formal documents, the evidence for the prosecution was brought to a close.

On Saturday, the SOLICITOR-GENERAL summed up the evidence at considerable length, pointing out the part each of the defendants had taken in the history of the company, and concluding by submitting to the jury that the defendants had been guilty of the criminal concert charged against them in the indictment.

COURT OF GENERAL ASSESSMENT SESSIONS, WESTMINSTER.

FRIDAY, FEB. 11.

(Mr. P. H. EDLIN, Q.C., *Assistant-Judge, presided.)*

CHELSEA WATER-WORKS COMPANY, *Appellants*, THE ASSESSMENT COMMITTEE OF ST. GEORGE'S UNION, *Respondents*.

In this case Mr. TICKELL applied, on the part of the company, to be allowed to withdraw this appeal, so that the original valuation of the land occupied by their mains and pipes laid in the parish of St. George's, Hanover Square, which was fixed at £5835 gross, and £5670 rateable value, might remain unaltered.

To this application Mr. CASTLE, on behalf of the Assessment Committee, consented.

ROMFORD PETTY SESSIONS.—THURSDAY, FEB. 3.

(Before Messrs. FOX, FRY, *and* MATHEWS.)

BREACH OF CONTRACT OF SERVICE.

Wm. Fox, *Joseph Healey*, and *George Jarvis*, stokers, were charged, on the information of the Romford Gas Company, with leaving their employment without due notice, &c.

Mr. *Joseph Latchford*, manager, said the company had been put to great inconvenience and considerable expense by defendants suddenly leaving their work without notice. The usual terms were a week's notice on either side, but defendants left their work on the Saturday previous, and did not return.

The only defendant who appeared was Jarvis, who said that there was no agreement as to a weekly notice when he was engaged.

He was ordered to pay compensation, 10s., costs 8s. 6d., or fourteen days.

Healey, who had neglected his work through getting drunk, &c., was ordered to pay 5s., costs 8s. 6d., or seven days.

Fox, who officiated as lamplighter, and refused to extinguish the public lamps, by which considerable waste of gas was entailed, was fined 10s., costs 8s. 6d., or fourteen days.

BOW COUNTY COURT.—FRIDAY, JAN. 21.

(Before Mr. J. B. DASENT, *Judge.)*

CLAIM FOR WAGES BY A MAN DISCHARGED FOR DRUNKENNESS.

A man named *Lankshire*, a scoop-driver, late in the employ of the West Ham Gas Company, sued for £1 18s. 6d. for wages due, in lieu of a week's notice.

Mr. PALMER, who appeared for the plaintiff, said his client had worked for the defendants many years, and it had been the custom, if a man did not get to his work at the proper time, another man was put on to the job, but the absentee had to pay for it. One day last December, the plaintiff, missing his first turn at 7 a.m., went to the works at 9 o'clock, and was told by the foreman he had better take a holiday that day, and come again the next, which he did, and was then told the manager had given orders that he was not to start again. He contended that as the men had been permitted for many years to be absent at times, and only had to pay for some one else doing their work, there was no justifiable ground for discharge.

The plaintiff was called, and proved the above facts.

Mr. *E. H. Thorman*, the company's manager, produced an agreement, dated July last, between the parties, which, amongst other provisions, authorized the company to discharge the man at any time, without previous notice, on account of drunkenness or other misconduct. Witness said plaintiff was intoxicated on the day in question, and was discharged on that account, and called witnesses to prove his assertion.

The JUDGE ruled that the agreement of July did away with the previous understanding or custom, and gave leave to the company to dismiss for drunkenness or other misconduct, so that the plaintiff was not entitled to recover.

Verdict for defendants, with expenses, 5s.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

METROPOLITAN BOARD OF WORKS.—At the Meeting of the Board on Friday last, the Parliamentary Committee presented the following report:—"Your committee have to report that they have considered the memorial from the Wandsworth District Board, referred to by the Board on Friday last, asking that a clause may be inserted in the Metropolis Gas Bill, to bring the Wandsworth and Putney Gas Company under the general gas legislation for the Metropolis. This company has not hitherto been considered as a metropolitan company, having been excluded from the operations of the Metropolis Gas Act, 1860; and it appeared to the Board, when preparing the Metropolis Gas Bill last year, that its provisions should only extend to the companies which were under the operation of the Act of 1860. The bill having been passed by the Select Committee of the House of Commons last year, after a long contest, and the Government having given a promise to the effect that if the same bill were laid before Parliament again this year a further investigation by a Select Committee should not be required, it appears to your committee that the Board must be regarded as virtually under an engagement to submit the bill to Parliament in the same terms, and, indeed, the Board has already so decided. This being the case, there would be a difficulty in seeking to extend the provisions of the bill to another company, and your committee recommend that the Wandsworth District Board be informed that the request contained in the memorial cannot be complied with." The report was adopted. A letter from the Shoreditch Vestry was read, referring to the proposed amalgamation of the Independent Gas Company with the Chartered and Imperial Companies, and requesting that the Board will not introduce any bill into Parliament or sanction any measure which does not adequately protect the interests of the consumers of the Independent district, and stating that should any amalgamation bill be promoted by the companies, including the Independent Company, without such provision, the vestry will oppose the same. The letter was referred to the Parliamentary Committee.

CAMBERWELL VESTRY.—At the meeting on the 9th inst., a report was submitted by a committee recommending that the vestry-clerk be instructed to present a petition to Parliament against the bill of the South Metropolitan Gaslight and Coke Company, and that he be empowered to employ a parliamentary agent and counsel, and take all such steps as he may deem necessary to support the petition in case of the bill being proceeded with. The discussion of the question was adjourned until to-morrow.

LAMBETH VESTRY.—At the meeting on the 10th inst., the Lighting Committee made a report, in which they stated that the average illuminating power of the gas supplied to the public lamps for the month was—Phœnix Gas Company, 14·90 candles; London Gas Company, 15·3 candles. The gas of the Crystal Palace District Company, when tested, showed 15·69 candles, and was also free from sulphuretted hydrogen and ammonia. The proportionate number of lamps out in the past four weeks was as follows:—Of the 728 lamps of the London Company, 63 were out; of the 1448 lamps of the Phœnix Company, 26; and of the 836 of the South Metropolitan Company, 7. A resolution was carried, to the effect that the medical officer be requested to test the gas of the Phœnix and the London Gas Companies twice a week for the next month, and report the illuminating power to the vestry. A special report was also presented from the same committee, as to the adoption of the average meter system. It stated that the committee endeavoured to obtain the best information, and the result of experience from those districts where the arrangements had been brought into working operation. From those results it appeared that, though a reduced expenditure for lighting purposes had been effected, the most material reduction in cost arose from a reduction in the time the lamps were kept lighted, and that the actual saving by average meter measurement was not a moiety of the reduction. In the case of the lamps supplied by the London Gaslight Company, the committee considered a useful and beneficial experiment might be tried, by having the lamps in that district lighted and paid for under the following regulations:—A Parkinson compensating meter to be fixed to one lamp in ten throughout the district; the vestry to provide and fix new regulators to all lamps; the company to light the lamps, clean, repair, and maintain the columns and lantern, as at present,

and be paid at the existing contract rate; the gas to be paid at the rate of the average registration of the meters, with an allowance of 2½ per cent. to be added for leakage and waste, in respect of lamps which are not fitted with a meter. The committee had had difficulty in coming to a recommendation upon the matter, and were not sanguine that a great saving would be effected, but they thought that better lighting would be obtained, and valuable experience and statistical information for future guidance be acquired, by working the 720 lamps lighted by this company; and they made the foregoing recommendations with a view to bringing the question to a solution by practical experience. The report was adopted.

Dr. Whitmore's report on the illuminating power, pressure, and quality of the coal gas consumed in the parish of Marylebone during January, 1876:—

	Illuminating Power in Sperm Candles.			Mean Pressure in Tenths of an Inch.		Mean Quanty. of Sulphur in 100 Cu. Ft.	Mean Quanty. of Ammon. in 100 Cu. Ft.	Sulphuretted Hydrogn.
	*Mean of 25 Obser.	Highest.	Lowest.	Highest.	Lowest.	Grains.	Grains.	
Imperial Comp.'s gas	16·29	16·91	15·42	23·86	8·71	20·25	0·73	No trace
Chartered Comp.'s common gas	16·37	17·11	15·84	28·87	15·55	16·87	0·56	No trace
Chartered Comp.'s cannel gas	20·42	21·62	19·64	18·21	11·25	23·05	0·90	No trace

Mean of daily readings of barometer . . . 30·09
" " " thermometer . . . 58·95

* Each observation consists of ten readings of the photometer, at intervals of one minute.

The mean illuminating power of the Imperial Company's gas was equal to the light of about 16¼ candles; it ranged between 15·42 and 16·91 candles. The mean amount of sulphur in 100 cubic feet of this gas was 20·25 grains, and of ammonia three-quarters of a grain. The mean light of the Chartered common gas was equal to 16¼ candles; it ranged between 15·84 and 17·11 candles; the mean amount of sulphur found was about 17 grains, and of ammonia half a grain. The mean light of the cannel gas was equal to nearly 20½ candles; it ranged between 19·64 and 21·62 candles; the mean quantity of sulphur found in it was 23·05 grains, and of ammonia 9-10ths of a grain. The pressure of all the gases was good, and on no occasion was sulphuretted hydrogen detected by the ordinary tests. The above results were obtained from the gas manufactured by the Imperial Company at their Fulham works, and from the Chartered Company's gas manufactured at their works, Beckton and Bow.

METROPOLIS WATER SUPPLY.

Dr. Whitmore in his report on the composition of Thames companies and other waters supplied to Marylebone during the month of January, 1876, says: "The water supply of the Metropolis has recently become a subject of discussion, and there are some persons who are disposed, unjustly, I think, to disparage both its quality and the sources of its supply. As to the sources of its supply, that is a question upon which I need not speak, but as to its quality, I venture to assert that any one who has given attention to the subject must be fully cognizant of the fact, that for some years past the water companies of London have been, and still are, adopting all possible means to render this first necessary of life—if not absolutely pure in a chemical sense—at least free from every hurtful or noxious ingredient; and that a large measure of success has already attended their efforts, is shown in the improved quality of their water, and the results of its chemical and microscopical analysis. The companies which supply this parish, owing to the number and extent of their subsiding reservoirs and filtering beds, are always in a position to avoid any large intake from the river Thames in times of flood, when the water is necessarily turbid, and hence it is that we obtain it at all seasons of the year, clear, bright, and well filtered. But unfortunately the water as delivered from the company's mains is often a very different article to that which is drawn from the cistern of the householder. In the wretched, confined little back yards of most of the small tenements situated in the Christ Church and St. John's districts, the water receptacles are generally foul, in addition to which the water in them, from their near proximity to the closet and the dust-bin, and from the passing of sewer gas into them through the overflow-pipe, becomes from these causes, still further polluted, in which condition it is not only detrimental to health, but a frequent source of fever. The only apparent remedy for this is the abolition of water receptacles in houses of this class, and the substitution of a constant supply."

	Total Solid Matter in degrees or grains per Imperial gallon.		* Loss by Incineration of Solid Matter in previous column.		Hardness before boiling, in degrees.	Hardness after boiling, in degrees.
	Jan., 1875.	Jan., 1876.	Jan., 1875.	Jan., 1876.		
Distilled Water	0°	0°	0°	0°	0°	0°
West Middlesex	21·72	20·89	0·92	0·88	14·02	3·01
Grand Junction	22·24	20·96	1·04	1·04	14·08	3·06

* The loss by incineration represents the amount of organic and other volatile matters contained in the Imperial gallon (70,000 grains) of water.

	Parts per Million. Free Ammonia.	Albuminoid Ammonia.
West Middlesex	·01	·07
Grand Junction	·02	·08

Dr. Frankland, F.R.S., reports as the result of his analysis of the waters supplied to the Metropolis during January, that, taking unity to represent the amount of organic impurity in a given volume of the Kent Company's water, the proportional amount found in a given volume of the water supplied by each of the other metropolitan companies was—New River 3·3, East London 4·0, Grand Junction 4·2, West Middlesex 4·8, Chelsea 5·3, Lambeth 5·4, and Southwark 6·7. It thus appears that the quality of the Thames waters supplied to the Metropolis in January was inferior to that delivered in the preceding month. The water of the Chelsea, Grand Junction, and Lambeth Companies was "slightly turbid from inefficient filtration, and contained in each case moving organisms." The water supplied by the Chelsea Company "also contained fungoid growths." The other samples of Thames waters were clear when drawn from the mains. The quality of Lea water supplied by the New River and East London Companies was, however, superior to that supplied in December, and had been efficiently filtered. The Kent Company's deep well water was of the usual excellent quality, and its temperature on the 12th of January was 50° Fahr., whereas the temperature of the river waters on the 11th of January ranged from 33·8° to 37·4°.

The Registrar-General publishes the following returns of the average daily quantity of water supplied by the London Water Companies during the month of January, 1876. According to these, 112,034,444 gallons, or 509,024 cubic mètres of water (equal to about as many *tuns* by measure, *tons* by weight) were supplied daily; or 214 gallons (97·2 decalitres) rather less than a *ton* by weight, to each house, and 30·1 gallons (13·7 decalitres) to each person, against 29·6 gallons during January, 1875. According to returns of the London Water Companies made to the select committee on East London Water Bills (session 1867), it is estimated that, during the year 1866, about 82 per cent. of the total average daily supply of water for all purposes was for domestic use; applying this proportion to the total quantity supplied daily in the month of January, 1876, it appears that about 91,868,244 gallons were probably used for domestic purposes, or about 24·7 gallons per day for each inhabitant, against 24·3 in the corresponding month of last year. This proportion varies from month to month, but the Registrar-General has no means of giving a more exact estimate.

Companies.	Number of Houses, &c., supplied in Jan., 1875.	Jan., 1876.	Aver. Daily Supply of Water in Gallons* during Jan., 1875.	Jan., 1876.
Total supply	515,292	523,487	108,399,761	112,034,444
From Thames	241,683	245,766	54,212,319	56,732,457
" Lea and other Sources	273,609	277,721	54,187,442	55,301,987
THAMES.				
Chelsea	28,490	28,600	7,097,600	6,709,800
West Middlesex	46,440	47,490	9,249,447	9,252,877
Southwark and Vauxhall	79,888	80,822	16,159,500	18,100,800
Grand Junction	35,144	36,036	9,828,572	10,380,880
Lambeth	51,721	53,318	11,877,200	12,288,900
LEA AND OTHER SOURCES.				
New River	122,890	124,656	23,953,000	26,089,000
East London	107,294	109,375	23,322,800	22,562,600
Kent	43,425	44,290	6,911,642	6,650,987

* Including that for manufactures and for various purposes other than for domestic consumption.

Note.—The return for January, 1876, as compared with that for the corresponding month of 1875, shows an increase of 8195 houses, and of 3,634,683 gallons of water supplied daily.

ECONOMIC GAS-STOVE COOKING APPARATUS.—At the Royal Aquarium and Winter Garden, Westminster, Messrs. Leoni and Co. have erected one of their complete cooking apparatuses, which is sufficiently large to cook *recherché* dinners for about 500 persons. Messrs. Bertram and Roberts (for whom the apparatus was specially designed) with their *chef*, concur in pronouncing it a great success, as the ovens are so ingeniously contrived that they prove equal to the task of roasting the largest joint, and of baking the most delicate pastry satisfactorily. The kitchen at the Royal Aquarium is the only one where cooking on such an extensive scale and of such quality is done by the sole agency of gas.

HYDRAULIC RAMS FOR COTTAGE WATER SUPPLY.—Mr. J. A. Davenport, surveyor to the Nantwich Rural Sanitary Authority, says there is at Lea Hall, near Nantwich, an arrangement which, in many instances, might be copied with advantage. There is a similar means of water supply in Bartherton township, and although there is nothing new in raising water by means of hydraulic rams, still he thinks there is a novelty in the general application of the little rams erected at these places. The water supply at Lea Hall is lifted from a stream which has been dammed, so as to obtain a head or fall of water of 8 feet 6 inches to the ram below, the supply of water to the ram being about 25 gallons per minute; the water is lifted to a tank holding about 2400 gallons, at a distance of about 100 yards, and at a vertical height of about 50 feet, the ram supplying water at the rate of 180 gallons in the hour, or, say, 4300 gallons per 24 hours. From the tank mentioned the house and farm buildings are supplied. There are taps at all required points in the farmyard for the 75 head of stock, taps to the stables, watering-troughs, and for the engine. To each boiler in the cleaning-shed there is a tap; the kitchen boiler and range are also supplied with water, and it might be thrown into the bed-rooms or the highest point in the house. The ram has now been working night and day continuously for 18 months, and its entire cost during that time has been only one shilling for a new washer, and there is no sign of depreciation or wear and tear. Taking the present as an instance, there would be a sufficient supply in the Lea Hall tank to give 20 gallons per 24 hours to 200 cottages, and cottagers at present seldom use more than 6 gallons in 24 hours, and the cost per annum (terminable, say, in 30 years) to each house would, irrespective of rights of way or water rights, hardly reach a shilling, making some allowance for additional mains.—*Builder.*

SOCIETY OF ENGINEERS.—The first ordinary meeting of this society for the present year was held on the 7th inst. in the society's hall, Westminster Chambers, Victoria Street. At the conclusion of the ordinary routine business, the retiring president, Mr. J. H. Adams, presented the premiums of books which had been awarded for papers read during the past year. The president for 1876, Mr. Vaughan Pendred, then delivered his inaugural address. He commenced with an expression of thanks to the members for the compliment paid him by electing him to the presidential chair. After commenting briefly on the satisfactory position of the society's affairs, he went on to speak of the engineer's place in nature as that of the great civilizer. Nearly all the natural comforts of modern life were due to the engineer, and, therefore, the engineer had great privileges and grave responsibilities. One of the privileges was that he alone could supply the soundest investments for the great mass of capital now lying idle, to the great injury of trade in this country. Engineers in Great Britain had, however, during the last year or two, manifested less energy than was desirable in supporting new engineering works—a circumstance originating, no doubt, in false delicacy, and certain to operate injuriously on the best interests of the nation. The privilege of the engineer was to find employment for money in developing the revenues of his and other nations, and so advancing civilization. The responsibilities of the engineer were defined by the fact that unless he exerted himself energetically, much suffering and disease and want of civilization must continue to exist. The engineer alone could improve the mutual economy of the world, and if the world was to be happier and better, the engineer, and the engineer alone, could produce that result. He might be asked what the engineer was to do, but he would not attempt to lay down principles of action which would suggest troubles to thoughtful members of the profession. He might point out, however, that a great necessity of the day was the improvement of the water supply of our towns and cities, and that this work required the best attention of the profession, which would find plenty of work in supplying the want. The regulation of our rivers, so as to prevent floods in winter, and to secure the storeage of water in summer, was another great work. But the greatest of all was the cleansing of the country by an efficient method of dealing with sewage. After alluding to experiences in coal-pits and the construction of harbours of refuge as eminently claiming the attention of engineers, Mr. Pendred concluded by calling attention to the importance of the members providing papers for the society, these papers need not be treatises, but might be brief but lucid explanations of certain features in engineering practice. He finished his address with a wish that the society might have a prosperous year, and a hope that when he resigned the chair to his successor, it might be found that if he had not merited the praise of the Society of Engineers, it would at least be found that he had not deserved their censure. The address was well received by an appreciative audience, and at its close a cordial vote of thanks was accorded to the president.

ACCOUNTS OF THE METROPOLITAN WATER COMPANIES, FOR THE YEAR 1874-5.

(The Accounts of the First Five Companies are for the Year ending March, 1875; the Last Three, December, 1874.)

Statement of Share and Loan Capital, and Expenditure on Capital Account.

Companies.	Total Share Capital authorized.	Share Capital Paid up.	Loan Capital authorized.	Mortgage and Debenture Debt.	Total Share and Loan Capital authorized.	Total Share and Loan Capital Paid up.	Total Expenditure on Capital Account.
	£	£	£	£	£	£	£
Chelsea	855,000	760,707	213,750	169,450	1,068,750	930,157	921,711
Grand Junction	1,000,000	939,405	250,000	244,200	1,250,000	1,183,605	1,165,099
Lambeth	1,250,000	953,650	248,000	233,350	1,498,000	1,187,000	1,171,966
Southwark and Vauxhall	1,518,000	1,339,070	482,000	429,790	2,000,000	1,768,860	1,751,734
West Middlesex	1,155,066	919,453	200,000	..	1,355,066	919,453	910,825
East London	1,400,000	1,625,560	620,000	250,000	2,020,000	1,875,560	1,895,348
Kent	600,000	555,180	150,000	42,000	750,000	597,180	527,031
New River*	2,019,958	1,743,158	1,000,000	991,193	3,019,958	2,734,351	2,727,949

* The New River Company's shares, as established by charter, are freehold, and are divided into moieties—one moiety, or 36 parts, being held by the incorporated "adventurers;" the other moiety, or 36 parts, being originally held by King James I., and subsequently by persons now called King's Shareholders, who are not incorporated with the adventurers. Both these moieties are again subdivided, and held by numerous persons, and being real estate, are subject to entail and to trusts for minors. By this company's Act of 1852 the amount "expended" by the company in their works "then in existence" was declared to be £1,519,958 and upwards, and the capital of the company was deemed to be £1,519,958. This Act did not, however, create shares or a share capital, or alter or affect the nature, rights, or status of the property as existing under their charter, the rights under which charter are, by the same Act, expressly reserved. This Act authorized the taking of certain lands for special improvements in their then existing works; and the company were by that and by subsequent Acts in the years 1854 and 1857 authorized to raise on bond or debenture stock £1,000,000 for special improvements and for their "general purposes." The amount of this bond debt, as it existed on the 30th of June, 1874, is here set forth:—

Bonds at 4 per cent.	£253,000
Debenture stock at the same period, at 4 per cent.	738,193
	£991,193

By "The New River Company's Act, 1866," the company were enabled to create a new description of shares, declared to be personal estate, to the amount of £500,000, for their general purposes. The amount of these new shares, as existing on the 31st of December, 1874, is here set forth:—

442 fully paid (£100)	£44,200
4475 on call (£40) paid	179,000
	£223,200

The dividend on these new shares is to be *pari passu* with that paid to the proprietors of the original shares of the company.

Details of Expenditure and Revenue.

Companies.	Maintenance. Reservoirs.	Distribution Works.	Pumping.	Filtration.	Salaries, &c.	Thames and Lea Conservancy, &c.	Rents, Rates, Taxes, and other Charges.	Management. Directors and Auditors.	Salaries, &c.	Collectors Commission.	Other Charges.	Total Expenditure for Maintenance and Management.	Revenue. Water-rents.	Rents of Land, Houses, &c.
	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Chelsea	..	3,972	8,532	992	3,162	1,300	4,266	1,085	2,284	1,886	1,363	28,842	83,976	507
Grand Junction	277	6,033	14,770	1,048	3,655	1,300	5,704	870	2,600	3,132	1,302	40,691	120,848	91
Lambeth	2,038	6,103	19,157	1,002	4,687	1,252	5,799	1,242	1,581	2,725	1,036	46,622	124,054	61
Southwark and Vauxhall	524	6,193	22,933	2,878	3,073	1,305	7,024	1,051	2,721	4,761	3,517	55,980	142,533	..
West Middlesex	1,223	2,757	12,973	1,087	5,740	1,318	7,076	1,879	2,958	3,642	1,346	41,999	144,779	680
East London	3,582	6,734	15,393	2,282	9,619	3,567	17,440	2,162	2,571	5,489	2,611	71,450	181,782	4,143
Kent	244	2,213	12,129*	..	2,488	..	4,403	1,573	689	2,442	2,058	28,239	76,438	2,530*
New River	6,753	27,958	23,717	3,573	6,761	2,384	32,952	6,802	8,367	11,137	3,401	133,805	340,745	10,526

* These items include the sum of £2422 14s. 11d., transferred from the contingency fund, on account of renewal of engines.

Expenditure and Revenue per Million Gallons.

Companies.	Maintenance. Maintenance and Repair of Reservoirs, &c.—including Cost of Labour and Materials.	Maintenance and Repair of Mains, Pipes, &c., and Works connected with Distribution including Labour and Materials.	Pumping-Engine Charges, Coals, Labour, &c.	Filtration—including Cost of Materials and Labour.	Salaries and Wages of Engineer, &c.	Management. Directors and Auditors.	Salaries of Secretaries and Clerks.	Collectors Commission.	Total Expenditure per Million Gallons.	Water-rents per Million Gallons.	Average Daily Supply.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	Gallons.
Chelsea	..	1 7 4	2 18 9	0 6 10	1 1 9	0 7 6	0 15 9	0 13 0	9 18 6	28 17 11	7,960,992
Grand Junction	0 1 4	1 9 6	3 12 2	0 5 1	0 17 10	0 4 3	0 12 8	0 15 4	9 18 9	29 10 4	11,215,494
Lambeth	0 8 9	1 6 1	4 2 0	0 4 3	1 0 1	0 5 4	0 6 9	0 11 8	9 19 6	26 10 10	12,805,048
Southwark & Vauxhall	0 1 7	0 18 9	3 9 6	0 8 9	0 9 4	0 3 2	0 8 3	0 14 5	8 9 9	21 12 1	18,073,613
West Middlesex	0 7 0	0 15 9	3 14 0	0 6 2	1 12 9	0 10 9	0 16 10	1 0 9	11 19 5	41 5 5	9,609,813
East London	0 8 8	0 16 4	1 17 3	0 5 6	1 3 4	0 5 3	0 6 3	0 13 4	8 13 1	22 0 4	22,616,673
Kent	0 2 0	0 18 1	4 19 0	..	1 0 4	0 12 10	0 5 7	0 19 11	11 10 6	31 4 0	6,712,614
New River	0 13 11	2 17 6	2 8 9	0 7 4	0 13 11	0 14 0	0 17 2	1 2 11	13 15 2	35 0 8	26,646,167

Expenditure and Revenue, compared with Previous Year, showing Increase or Decrease in each Item.

	Chelsea. Inc.	Chelsea. Dec.	Grand Junction. Inc.	Grand Junction. Dec.	Lambeth. In	Lambeth. Dec.	Southwark and Vauxhall. Inc.	Southwark and Vauxhall. Dec.	West Middlesex. Inc.	West Middlesex. Dec.	East London. Inc.	East London. Dec.	Kent. Inc.	Kent. Dec.	New River. Inc.	New River. Dec.
	£ s. d	£ s. d	£ s. d	£ s. d	£ s. d	£ s. d.	£ s. d	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d	£ s. d	£ s. d	£ s. d	£ s. d
Reservoirs	..	..	..	92 0 0	..	235 0 0	62 0 0	..	514 0 0	..	..	710 0 0	78 0 0	..	..	880 0 0
Do., per million galls.	..	..	..	0 0 5	..	0 1 4	0 0 3	..	0 4 7	..	..	0 1 10	0 0 7	..	..	0 3 1
Distribution	1089 0 0	..	1072 0 0	..	8 0 0	..	1372 0 0	..	..	88 0 0	..	1275 0 0	..	497 0 0	5503 0 0	..
Do., per million galls.	0 8 3	..	0 6 1	..	..	0 0 11	0 4 8	..	..	0 0 10	..	0 3 2	..	0 4 8	0 7 7	..
Pumping	..	1453 0 0	..	4389 0 0	..	1387 0 0	..	4454 0 0	..	1567 0 0	..	692 0 0	..	882 0 0	4005 0 0	..
Do., per million galls.	..	0 7 3	..	0 18 4	..	0 9 1	..	0 10 9	..	0 10 8	..	0 1 11	..	0 10 2	0 4 11	..
Filtration	48 0 0	..	..	41 0 0	..	23 0 0	587 0 0	..	132 0 0	..	..	141 0 0	..	..	..	297 0 0
Do., per million galls.	0 0 7	..	..	0 0 1	..	0 0 4	0 2 0	..	0 0 7	..	..	0 0 5	..	..	..	0 1 3
Total expenditure	..	717 0 0	..	4684 0 0	..	1491 0 0	243 0 0	..	..	753 0 0	..	540 0 0	250 0 0	..	9111 0 0	..
Do., per million galls.	0 3 0	..	..	0 15 7	..	0 13 9	0 0 6	..	..	0 9 7	..	0 2 4	..	0 4 5	..	0 2 3
Water-rents	2708 0 0	..	2665 0 0	..	6183 0 0	..	7882 0 0	..	9149 0 0	..	10006 0 0	..	8254 0 0	..	22594 0 0	..
Do., per million galls.	2 0 5	..	1 12 1	..	0 8 6	..	1 17 7	..	1 15 6	..	1 1 9	..	2 11 9	..	..	0 7 1

YORK UNITED GAS COMPANY.

The Half-Yearly Meeting of Shareholders was held on the 3rd inst.—Mr. R. WEATHERLEY in the chair.

The SECRETARY (Mr. C. Sellers) read the directors report as follows:—

In submitting their report for the past year, your directors have to state that the progress of the company's business has been fully up to the usual average, and they trust that the financial results will be deemed satisfactory. Your directors have pleasure in stating that the replacement of old purifying plant by four large and improved boxes, referred to in their last report, is now complete, and the new apparatus at work. The remodelling of a large portion of the retorts, for the purpose of increasing the company's carbonizing power, will be carried out next summer. To provide the necessary capital for these additions to your works, your directors have determined to make a call of £1 per share, upon the 5000 new shares of the company, payable on the 1st of April next. The increase in expenses during the half year, on account of special work in connexion with the recent extensions and alterations of buildings, has been more than counterbalanced by the reduced cost of coal. Your directors are, therefore, glad to state that the balance of profit available for dividend enables them to recommend the usual distribution of 5s. per share upon the old shares, and 4s. per share upon the new shares, the same to be paid on and after the 8th inst., free from income-tax.

The trade account showed the following results:—Sales of fittings. £1892 6s. 10d.; sales of gas, coke, &c., £16,886 9s. 11d.; goods and packages returned, £14 4s. 7d.; received on account of bad debts, 12s. 8d.; bankers interest, £63 12s. 5d. The payments were—Fittings and fitters wages, £1534 17s. 11d.; coal and lime, £8233 1s. 10d.; retorts, ironwork, meters, lamps, wages, &c., £2176 11s. 11d.; directors, £300; salaries and stokers wages, £1817 3s. 11d.; rates, taxes, &c., £207 13s. 11d.; printing, advertising, stationery, &c., £42 1s. 4d.; law charges, £26 3s. 8d.; bankers charges, £47 7s. 8d.; sales returned, £61 2s. 7d.; discounts and abatements, £4 17s. 5d.; bad debts, £8 18s. 1d.; leaving a balance of £4956 19s. 11d., out of which sum £4750 is required to pay the dividend.

The CHAIRMAN, in moving the adoption of the report, said he thought the shareholders would agree with him that the financial results of the past six months working were fairly satisfactory. He need scarcely remind them that the half year had been a very busy one indeed, in consequence of the large amount of work they had had to do in connexion with the new purifiers, and in enlarging and improving the lime sheds. The new purifiers were now, however, completed, and if they proved as satisfactory in their working as the directors expected they would, they would be a very valuable addition to the works, and meet the requirements of many years. Those purifiers had been constructed on the most modern principles by the most eminent engineer. He had previously informed the shareholders that the consumption of gas was approaching a point which would render necessary the provision of an increased number of retorts, so as to place them in a position not only to meet the present wants of the town, but to meet the growing demands of the future. The business of the company had now reached that point, and they were remodelling a set of 18 of the double bench of retorts, which they were doing in such a manner that where they had now only three retorts they were constructing five, and thus increasing their carbonizing power. This would place the company in a more satisfactory position, and meet the increased business which, no doubt, the future would bring. As a matter of course, all these items entailed a great deal of cost, and to meet that expenditure, as the report stated, the directors had determined to make a call upon the new shares of £1 per share, which would produce a sum of money amounting to about £5000. This course was absolutely necessary, for the capital account was already overdrawn. As regarded the general business of the company, he thought he might say that the directors so far had succeeded in satisfying the shareholders and the gas consumers, who now felt a great interest in the welfare of the company, which was a condition that ought to exist in connexion with all public companies.

The motion having been seconded, was put and carried.

The CHAIRMAN then proposed a formal resolution, to the effect that the dividends mentioned in the report be declared, which was seconded by Mr. J. F. TAYLOR, and adopted.

Mr. BULMER, in moving a vote of thanks to the directors for their services, alluded to the call of £1 per share on the new shares, and remarked that the proposed expenditure would conduce greatly to the benefit of the company. He asked if no more modern system of lighting the street lamps could be adopted, and for what purpose a number of buildings were being erected in the gas-works yard, and to what account the cost would be charged.

The CHAIRMAN replied that the buildings referred to were three cottages for the use of certain workmen. The company had long felt the necessity of having some workmen residing close to the works, ready to be called upon in cases of emergency, and also for the convenience of the public, who frequently sent to the works, after business hours, about little mishaps which required immediate attention. The cost of these cottages would amount to £600, which would be charged to capital account. As to lighting the street lamps, he was of opinion that there was no better system than that observed in this city.

Mr. D. FELTOE seconded the vote of thanks.

Mr. W. W. HARGROVE had pleasure in supporting the resolution, because it must be highly satisfactory to them all that, in the face of an increased expenditure, the directors had so efficiently managed the business of the company as to be able to declare the same dividend as previously. The erection of the cottages, with the object stated by the chairman, would be highly advantageous to the shareholders generally.

The motion was put and carried; and thanks having been given to the chairman, the proceedings terminated.

YORK NEW WATER-WORKS COMPANY.

The Half-Yearly Meeting of Shareholders was held on the third inst.—Mr. J. F. TAYLOR in the chair.

The report of the directors stated that during the half year there had been a satisfactory increase of revenue. The directors had entered into engagements to make immediately important extensions of the mains, which they had no doubt would prove advantageous to the interests of the company. They recommended that a dividend of 7s. per share for the past half year, being at the rate of £7 per centum per annum, be declared, and that the same be paid, without deduction for income-tax, on and after Feb. 8, 1876. The directors, in pursuance of the resolution passed at the last meeting of the shareholders, were promoting in Parliament a bill for empowering the company to construct additional works, to raise additional capital, and for other purposes. Acting on the strong advice of Messrs. Hawksley, the engineers, the directors had thought it advisable to apply for power to raise capital to a larger extent than was at first contemplated; but they felt assured that the shareholders would fully concur in the propriety of the course taken, particularly as the engineers had expressed their opinion that such a step was absolutely necessary to enable the company to meet the present and future requirements of the public.

The revenue account showed the following results:—Balance as per last statement, less dividends, £1071 13s. 3d.; half year's water-rents, £5398 17s. 10d.; property-rents, £27 7s.; discounts, 12s. 3d.; bankers allowance for interest, £21 17s. 5d.; sales of sand, £10 5s. 8d.; sales of engine ashes, £4 1s.; sales of plumbers fittings, £244 7s. The expenditure was—Salaries and wages, £558 17s. 7d.; coals for engines, £356 2s.; coals and gas for offices, £3 15s. 8d.; oil, tallow, candles, and waste, £49 11s.; property-rents, 10s.; rates and taxes £88 5s. 2d.; stationery, £13 13s. 5d.; printing and advertising, £17 14s.; directors, £150; auditors, £4 4s.; legal expenses, £7; sundry disbursements, £6 14s. 7d.; repairs of engines, £263 18s. 7d.; repairs and cleansing of reservoirs, £62 17s. 2d.; repairs of mains and works generally, £181 8s. 7d.; new works, £140 7s. 10d.; interest on loans, £171 1s. 3d.; bankers charges for commission, £12 13s. 6d. The balance in hand amounted to £4513 3s. 8d.

The CHAIRMAN moved the adoption of the report, and said he thought the shareholders must be satisfied with the increase of revenue, during the past half year, over that of the corresponding period of last year. Referring to the extension of the mains mentioned in the report, he observed that a contract had already been entered into for the supply of the pipes for one section, which was being laid down to that part of York which was occupied by the foundry of Messrs. Close and Ayre and the Railway Plant Works. The proprietors of those works had earnestly requested the directors to supply water to that district, and in doing so they believed they were taking a step which would prove to the advantage of the company. A number of cottages were being built for the convenience of the labourers there, which would require to be supplied with water. The directors had also under consideration another large extension, but they had not yet made any arrangements with regard to it, and had therefore nothing to report about it. He might, however, state that at the village of Acomb the water had been condemned; and as the residents there were anxious to have the company's water, the directors had the subject under consideration, about which they might have something to report at the next half-yearly meeting. Speaking of the bill which the company had promoted, he said that, so far, it was an unopposed bill, and that it must be a great satisfaction to the shareholders to know that there would be no fight about it in the House of Commons. The bill had already passed the Examiner of Private Bills, and, when it came before the committee of the House of Commons, it would be arranged to the satisfaction of the shareholders, and in a manner that would ultimately prove to the advantage of the company. There were, however, certain alterations in the bill to which he might allude. At the last half-yearly meeting it was intimated that the amount of increased capital that should be applied for was £28,000, with borrowing powers to the extent of £7000 more; but the directors had had so much influence brought to bear upon them, and so many representations made to them by people well qualified to give an opinion, that that sum would be insufficient, considering the progress the city of York was making, and was likely to make in the future, that they had extended their application, and asked for a capital of £60,000. Although they sought power to raise that sum, yet they had no immediate requirement for it, and the shareholders must distinctly understand that the directors had no power to raise any portion of it without obtaining their consent. As they were going to Parliament, and acting under competent advice, they considered it necessary to seek for those additional powers.

Mr. J. L. FOSTER seconded the motion for the adoption of the report.

Mr. W. C. ANDERSON said he was sure the directors would not have decided to go to Parliament without sufficient reason. He greatly regretted that it had been found necessary to do so, on account of the very large expense that would be incurred. That various extensions were required he had no doubt, but he was of opinion, as were also some of the directors, that those extensions might have been carried out without having to apply to Parliament.

The CHAIRMAN replied that the question of applying to Parliament was settled at the last meeting, and he thought the decision was arrived at from the fact that for 25 years they had had their capital account closed, and any extension that had taken place during that period had been paid for out of revenue. They had now before them such a large expenditure, that they considered it was necessary to raise additional capital. As to the cost of the bill, he could only say that it would be less than if it had been opposed, and it would not amount to a very great deal.

The report was then adopted, and the dividend, as declared in the report, was confirmed. The retiring directors and auditor were re-elected.

The meeting then proceeded to the consideration of the company's bill, and Mr. J. P. WOOD having read the heads of the clauses,

The CHAIRMAN moved—"That this meeting approves of the bill introduced into Parliament, and now submitted to the proprietors, entitled 'A Bill for empowering the York New Water-Works Company to construct additional works, raise additional capital, and for other purposes,' and authorizes the directors to make or assent to any alteration therein which may appear to be expedient, and which Parliament may sanction or require." Having already spoken of the capital, there was nothing to which he need allude, except two clauses. They had made two concessions in the Act agreeably with the Urban Sanitary Committee of the Corporation. The old Act only compelled them to supply water for domestic purposes, and not for trade purposes, although he was bound to say that they had never refused any application for water for trade purposes. The Urban Sanitary Committee, however, thought compulsory powers ought to be contained in the bill, and as they had never refused to supply water for such purposes, they consented to the insertion of the clause. The next clause referred to the inspection of the works, and as they felt they had no fear at all about any one taking samples of the water, they consented to a properly authorized person obtaining samples of water for analysis, believing that it would give the citizens greater confidence. If the bill was passed, he had no doubt the company would have before them a bright and prosperous future. The bill, he added, was to be supported by the two city members. In reply to a question by Mr. Anderson, whether the water would be supplied gratuitously to the urinals, he said the directors had made the Sanitary Committee a liberal offer, which they believed they would accept. He informed Mr. Eymer that the new Act would not infringe any powers contained in the old Act of declaring a dividend of 10 per cent. In the new Act the dividend was restricted to 7 per cent.

Mr. J. L. FOSTER seconded the chairman's motion, which was unanimously adopted.

Mr. FELTOE, in moving a vote of thanks to, and of confidence in, the directors, again called attention to the necessity of forming a reserve-fund.

Mr. JOHN BROWN seconded the resolution, and expressed an opinion that they did not require a reserve-fund, believing that they were in a perfectly secure position.

The CHAIRMAN having acknowledged the vote of thanks, the meeting separated.

PROPOSED PURCHASE OF THE WARRINGTON GAS-WORKS.

At the Monthly Meeting of the Warrington Town Council, on Tuesday, the 1st inst., the MAYOR (Mr. Webster) presiding, a report of the General Purposes Committee was read, from which it appeared (*inter alia*) that at a meeting of that committee on the 21st ult., a discussion took place as to the desirability of purchasing the gas-works, when it was resolved—"That the matter be brought before the council at the next meeting, with the view to ventilating the question, and giving this committee instructions to form a sub-committee to approach the company to carry out this important measure."

The MAYOR, in moving the confirmation of the minutes of the committee, remarked that the most important matter to which he had to refer was the proposed purchase of the gas-works. The committee were of opinion that the time had come when they might ask the gas company to sell their works. The extension of the town in various directions, and also the state of the older parts of the town, were such that a rearrangement of the lighting had become absolutely necessary. He thought it would present itself to the minds of most of them that this might be more satisfactorily done if the Corporation had the control of the gas-works. He thought that all institutions which were connected with the sanitary improvement of a town ought to be in the hands of the Corporation. If the Corporation had the gas-works in their hands they could adopt such measures as they thought fit. If the council approved of the suggestion, of course, the better plan to adopt would be to appoint a committee

for the purpose of ascertaining what terms could be come to with the gas company for the purchase of their works.

Mr. J. HARRISON seconded the motion, and said he thought the public and the council generally would regard with satisfaction the recommendation of the General Purposes Committee to purchase the gas-works. He thought that it was most important that both the gas and water works should belong to the Corporation. Institutions of that kind should not be exclusively confined to the hands of people who sometimes might be rather capricious from the difficulty there was of bringing public opinion to bear upon what they did. If the gas-works were in the hands of the Corporation, public opinion might be brought to bear upon them through the medium of those who voted for the election of the members of the council.

Alderman J. DAVIES also spoke of the advantages which would accrue to the Corporation from the purchase of the gas-works, and said at present, with regard to the public lamps, they must all admit that the lighting of the borough was not at all equal to the requirements; on the contrary, if they went into any small town in Lancashire they would not see a worse lighted place than Warrington—he was speaking more particularly with reference to the outskirts. He did not for a moment say this was the fault of the gas company. It was the duty of the Corporation to give notice of any desire for increased lighting, and he thought it was due to the gas company that this explanation should be offered. Streets were also continually disturbed for the laying down of mains, and he thought when the works belonged to the Corporation, the work would be conducted with sure regard to public convenience. Speaking from a ratepayer's point of view, which he did at the present moment, it was a source of satisfaction to reflect, that any advantage which might accrue from the purchase of the gas-works would go toward the reduction of the rates. He had gone over the figures himself, and was quite satisfied that when the time came for purchasing the gas-works, they would be able to pay the shareholders a good price, and realize a very handsome profit for the ratepayers generally.

Mr. KEAN said, as a Corporation, they could give the gas company great credit for the way in which they had supplied the town with gas. The fact of there being a deficiency of gas-lamps was no fault of theirs, but of the Corporation; whilst, when the coal stood at a very high figure, they never gave the slightest intimation of a desire to raise the price of gas.

Alderman DAVIES: They could not, because they were charging the maximum price.

Mr. FAIRCLOUGH supported the proposition.

Alderman BURGESS said that some years ago, when he was not a member of the council, an arrangement was made for the purchase of the gas and water works, and for carrying out other extensive improvements in the borough. He took part in opposing the scheme; but his reason for doing so was simply this. The Warrington of 10 or 12 years ago was very different to what it now was, and it did not then appear wise to enter into engagements which involved an expenditure of between £150,000 and £160,000. It was the fashion then to speak of Warrington as a sluggish town; but, as one of the newspapers said, "It now moves." The circumstances of the Warrington of 1876 were very different to those of 1864-65, and he could conscientiously join the General Purposes Committee in their desire to purchase the gas-works for the borough. He believed the council would be doing quite right in supporting the committee in seeking fair and equitable terms upon which to acquire that property in the interest of the ratepayers. There was no doubt that the extension of the borough would bring with it an increased consumption of gas; and this extension would have the effect of increasing the profit which would be realized from the acquisition of the gas-works, inasmuch as if they had to carry a long series of mains into a country district which was sparsely populated, it was a very expensive matter. At present the town was rapidly growing all round, and the probability was that, in course of time, every dwelling-house would require gas. It appeared to him to be a correct and reasonable thing, that the more densely an area was populated, the greater would be the demand for gas; and, consequently, the greater the amount of profit derivable from the works. He cordially supported the committee in their recommendation, and hoped they would bring the impending negotiations with the gas company to a successful issue.

Mr. WHITTLE remarked that something had been said with regard to the quality of the gas; but, so far as he could judge, they could not have better gas than what was supplied to them.

Alderman HEPHERD said, being a shareholder of the gas-works, he did not think it would be wise for him to say anything either *pro* or *con.* with reference to the purchase by the Corporation; but he rose for the purpose of removing some wrong notions which existed with respect to their management. Some one had remarked that the town was one of the most badly lighted in Lancashire. He wished to ask the members of the Corporation if ever an application made to the directors of the gas company for additional light in the borough had been refused. As chairman of the Street Improvement Committee, he could answer "No." Then there was the quality of the gas. Some years ago an arrangement was made for the borough to be supplied at 3 cubic feet per hour, but they gave three-quarters of a foot more than they were bound to do. The public lamps in the borough for the last three or four years, on the average, had not been a profit to the company.

Alderman HOLMES said that, speaking from a sanitary point of view, he was of opinion that the water supply should be in the hands of the Corporation, as well as the gas.

Alderman PICKMERE said, as a large shareholder of the gas-works, he could not allow the opportunity to pass without remarking that he did not think the gas company ought to be reproached in the way they had been by one or two members of the council. If they were approached in a proper spirit, he had no doubt some arrangement would be made. Every member of the council should be cautious how he spoke of the company.

The MAYOR said he was glad to find that there was such a unanimous feeling of approbation, on the part of the council, with reference to the steps taken by the General Purposes Committee for the purchase of the gas-works. On behalf of the company, he might say that, in nine cases out of ten where complaints were made of the gas, it was found that the burners were at fault.

The minutes were then put, and unanimously agreed to.

BEVERLEY CORPORATION GAS SUPPLY.

On the 2nd inst., Mr. J. T. HARRISON, C.E., an Inspector of the Local Government Board, attended at Beverley to receive evidence with respect to an application by the Town Council for permission to borrow the sum of £3000 for the extension of their gas-works.

Mr. MILLS, the deputy town-clerk, stated that at the present time the Corporation were brought to a crisis because the War Office required gas for the new barracks, and this would tax their supply to a greater extent than they were able to bear, and the provision was at present scarcely sufficient, nor had there been a plentiful supply of gas for some time. The gas-works were made in the year 1824, consequently they required a larger outlay than more modern works would do. In 1808 the Corporation obtained an Act for lighting the streets with oil lamps. Afterwards, in 1824, the Corporation contracted with Mr. Malam, the proprietor of the gas-works, for lighting the public streets with gas, but some doubt existing as to the legality of such a procedure, inasmuch as the Act was for the lighting of the streets with oil lamps only, in 1825 the Corporation obtained another Act giving them power to acquire the gas-works for that purpose. They then purchased the works from Mr. Malam for £9000, and it was probable that Beverley was one of the oldest towns in England lighted by gas, having been lighted in that manner for 50 years. There had always existed a permanent capital debt of £9500, owing to this purchase. In 1851, by a Provisional Order dated the 22nd of May, the powers of the Lighting Commissioners were transferred to the new Local Board of Health, and the power the Corporation now sought to obtain would be under these two Acts. They then went on until 1866 when they were pressed for further gas lighting power. They only had at that time their old gasholder, and several necessary improvements were required. On May 1, 1866, they obtained the authority of the Local Government Board, to borrow on the security of the general district rate the sum of £5000, which sum was obtained from the Yorkshire Insurance Company. They had repaid £2000 of that sum, and the whole amount would be paid back in 20 years. This was the only debt, with the exception of a sum of £700, which was expended in the purchase of a small garden adjoining their works, and which it became necessary to acquire. They therefore entered into an arrangement with the parties owning it, that the purchase-money should remain on the security of the place, the Corporation paying them interest.

The INSPECTOR: I do not suppose you could legally do that.

Mr. MILLS: I think we could, under our local Act.

The INSPECTOR: We need not trouble about that. What is the increase in the consumption of gas?

Mr. MILLS replied that it had increased about 200 per cent. during the last 20 years.

Mr. NORFOLK (the chairman of the Gas Committee) observed that the present daily consumption was 161,000 feet.

Mr. BRYAN (gas manager) stated that the total consumption for 1855 was 9,954,400 feet; in 1865, 19,049,500; in 1875, 28,268,700.

Mr. MILLS added that the Corporation had continued to spend very considerable sums upon the gas-works, until the ratepayers thought they ought not to make this outlay out of income, especially with this War Office application. The purifier was very old, and he was told that the work it did was exceedingly bad. Of the improvements they had made, almost everything had been done out of income up to the present time.

The INSPECTOR inquired the present price of gas.

Mr. MILLS replied that they had charged as low as 2s. 11d. per 1000 feet, but the present charge was 4s. 2d. They got into debt during the coal famine and had not got out yet.

Mr. NORFOLK remarked that the present price was not extravagant.

The INSPECTOR: They have reduced it to 4s. in London, and you are much nearer the coal districts.

Mr. MILLS said he looked to the time when they would resume the old payment of 2s. 11d.

Mr. BRYAN then produced the plans of the proposed improvements, which were inspected by Mr. HARRISON, who inquired if they had been drawn up on the most approved scale.

Mr. BRYAN replied that they had got the best they could obtain, and he then proceeded to enumerate the several items with the estimates, all of which, he explained, were in accordance with tenders. The specifications included a new purifier at a cost of £740 complete, new scrubber at £400, 4-horse power engine £157, weighing machine £130, and £427 for the building of engine and purifying houses.

In answer to the Inspector, Mr. BRYAN stated that the sum sought would be sufficient for their purpose.

The INSPECTOR: Does any gentleman object to this expenditure?

Alderman WREGHITT: We all approve of it very highly.

Mr. MILLS: Our gas-works have suffered very much during the last few years. I do not think you will find any objection in the town.

The INSPECTOR: It is quite reasonable. How do you propose to get the money?

Mr. MILLS: We thought of applying to the Public Works Commissioners.

The INSPECTOR: No hope from them, I think.

Mr. MILLS: I am afraid we shall have to go to the open market for it, and borrow of one of the insurance companies.

The INSPECTOR asked how it would be repaid.

Mr. MILLS replied that the present rate was exceedingly low, and the cost would be defrayed out of the general district rate. It would make only a very slight addition to it, and would scarcely be felt.

After some minute inquiries by the INSPECTOR, as to the condition of the sewerage of the town, the importance of improving which he strongly urged upon the council, a visit was paid to the gas-works, which the inspector expressed himself fully satisfied with, as they stood, and also as to the nature of the application.

DECOMPOSITION OF PRODUCTS OF SEWAGE.

Popoff has investigated the phenomena attending the spontaneous decomposition of a slimy mass taken from the mouth of a street sewer where it discharged into the river. It contained every possible sort of kitchen refuse, as well as other organic matter, in an advanced stage of decay. It was of the consistence of pap, had a dirty grey appearance, and a reaction neutral or scarcely perceptibly alkaline, and emitted a peculiar odour. Flasks were filled with this matter, somewhat diluted, and the gas given off was examined at intervals of two to four days. One sample gave off the following amount of gases within 3½ weeks:—

	Carbonic Acid.	Marsh Gas.	Oxygen.	Nitrogen.
A.	11·75	2·48	4·71	81·06
B.	34·99	29·03	—	35·98
C.	55·81	42·54	—	1·65
D.	56·00	42·70	—	1·30
E.	45·90	54·10	—	—
F.	43·30	56·60	—	0·10

At first the enclosed air lost its oxygen, and there remained merely a mixture of carbonic acid and marsh gas (CH_4). At first the carbonic acid preponderated, afterwards the marsh gas.

The slime consisted of (in addition to some amorphous inorganic matter and numerous crystals of carbonates) cellulose and a large number of pigment bacteria, among which the red and yellow predominated; then the green and other forms of zoöglœa. These organisms were already present in the decomposing mass in large quantities, and increased so prodigiously, by long continued putrefaction, that it was easy for the unaided eye to recognize them from the red and green colours. This very considerable increase of the bacteria, which kept pace with the production of carbonic acid and marsh gas, permits us to recognize the reciprocal relation. Careful observation of the temperature within a flask, as compared with the air outside, showed that the heat in the flask was always greater. At the beginning the difference was slight, from 0·36° to 0·72° Fahr.; at the close of the second month, the difference had increased to 0·8° and 1·0°. This production of heat in the putrefying substance, which could be detected in spite of the heat continually rendered latent by the developed gases, makes this operation analogous to alcoholic fermentation.

As in fermentation, so too in the production of marsh gas, the temperature has an important effect. The evolution of marsh gas was observed at different temperatures, which remained constant during the experiment, from 42·8° to 164° Fahr., and it was found that the production of marsh gas increased very strikingly with a rise of temperature. The greatest evolution of gas was observed at 128° Fahr.; from 113° upward it decreased, and ceased entirely at 122° to 131° Fahr. Masses of this slime, which had been heated for one or two hours up to 275°, 230°, 212°, 167°, 127·4° Fahr., so as to kill the bacteria,

evolved no gas at all. On the other hand, a mass which had been frozen was just as capable of fermentation after it was thawed out, as that which had not been frozen. The composition of the gases evolved at various temperatures only differed in this, that at higher temperatures the marsh gas very soon began to predominate over the carbonic acid, while at lower temperatures this required a longer time.

Another analogy between the evolution of marsh gas and other forms of fermentation is found in the circumstance that such substances as the cyanide of potassium, quinine, chloroform, carbolic acid, &c., which check fermentation, also check the production of marsh gas.

Further experiments prove that, in the decay of cellulose, marsh gas is the chief product formed. Hence it is clear why marsh gas appears in nature in places where large quantities of vegetable remains, which consist chiefly of cellulose, are heaped up, as in swamps and bogs, on river banks, in coal mines, &c., where the decomposition of cellulose takes place on a large scale. In this way, too, may be explained the fact that marsh gas is often evolved in the alimentary canal of man and the higher orders of animals.—*Scientific American.*

[We publish this report as we find it, but it is only fair to state that the results arrived at by the author of the paper simply come in confirmation of experiments made by Dr. Letheby years ago, and communicated in a report to the City Commissioners of Sewers.—Ed. J. G. L.]

ARTIFICIAL ALIZARINE.

By M. F. Dupuey.

[From the *Journal de l'Eclairage au Gaz.*]

On the 25th of June, 1869, Graebe, Liebermann, and Caro patented the action of sulphuric acid, concentrated at a high temperature, upon anthraquinone, in order to transform it into bisulpho-anthraquinonic acid, which took the place of the bibromanthraquinone in the principal patent, and which, when treated like it with caustic potash, formed alizarine. The general method of proceeding was thus very clearly defined, and since then no other has been proposed.

The inventors indicated beyond this the direct action of sulphuric acid upon anthracene, in order to transform it into bisulpho-anthracenic acid. An ulterior oxidation by manganese or permanganate would convert it into bisulpho-anthraquinonic acid, which, when treated with potash, produces alizarine. Although certain results have been obtained by this method, it has not, as far as we know, been employed commercially, the difficulties in the way of the oxidation of the bisulpho-anthracenic acid being considerable, and not giving the theoretical results.

It is, therefore, with anthraquinone, treated with concentrated sulphuric acid, that the greatest quantity of artificial alizarine is actually manufactured. This industry, which came into existence five years ago, has already furnished important results, and has taken a very significant place in consumption. Eight works, two of which are of considerable importance, are in operation in Germany, one in England, and one in France. The quantity at present produced may be estimated at 4500 kilogrammes (about 4½ tons) per day, of which Germany furnishes two-thirds, England 1000 kilogrammes (about a ton), and France 800 kilogrammes.

If the question be asked, what influence this new industry can have upon that of madder, it may be replied that the vegetable colour has already had to submit to competition in some of its markets; and the extracts of madder, with the exception of some special kinds, have almost entirely disappeared before artificial alizarine.

In one of the manufactures in which the greatest quantity of flour of madder and madderine was employed—that of Adrianople red—artificial alizarine only is now used, with advantageous results, as well with regard to solidity and brilliancy of shade, as to simplicity in manipulation.

As to believing that madder will completely disappear, we can only foresee such an event in a still very distant future; it will depend above all upon the price to which the raw material—the anthracene—may come down.

Up to the present time, England has had the monopoly of this production; but, happily, considerable efforts are now being made in France to utilize a source of wealth which has hitherto been permitted to be lost.

In very few works, in fact, was the tar distilled; it was sold at a very low price, for the manufacture of compressed fuel. The prominence given to this industry in England is beginning to manifest itself in France, and French anthracenes may now be bought. We have every reason to believe that in a very short time this industry will become general, and that Lyons and the South will be found distilling their tar as well as Paris and the North. Besides, this industry is sufficiently remunerative to induce the managers of gas-works to enter into it.

The following is a rough estimate of the products obtained by the distillation of coal tar, by which operation it acquires a value double that which it represented in its crude state. One thousand kilogrammes of gas tar produces—

Ammoniacal liquor	100 to 114 litres
Essence of naphtha	20 „ 40 kilos.
Light oils, with benzole and toluole . . .	70 „ 80 „
Heavy phenic oils	320 „ 350 „
Green fat, 10 per cent. of anthracene . .	100 „ 110 „
Pitch	— „ 450 „

The commercial value of these products may be taken as follows, calculating the tar at 7 fr. per 100 kilogrammes, although its average price does not exceed 6 fr. 25 c. in the markets of Paris and Lyons:—

1000 kilogrammes of tar, at 7 fr. per 100 . .	70·00 francs.
Ammoniacal liquor	—
Essence of naphtha	10·00 „
Light oils	35·00 „
Heavy oils	32·00 „
Green fat	60·00 „
Pitch	22·50 „
	159·50 francs.

The above products are those resulting from the distillation of tar in boilers of 8000 to 10,000 kilogrammes capacity, as large quantities must be operated upon to arrive at an exact fractional division of the several products.

This estimate is sufficient to demonstrate the advantages that would be likely to result in many respects from the establishment of works suitable for the distillation of tar, instead of allowing to pass away as smoke a considerable quantity of useful matters which might be extensively employed in various manufacturing operations, the raw materials of which have now to be sought in England. We have given as the average yield of anthracene from tar a quantity not exceeding 1 per cent.; but certain English coals, when well distilled, furnish more than that. We prefer, however, to state that amount of yield, in order to be below the actual quantity. Moreover, in thoroughly distilling the tar in such a manner as to sacrifice the pitch, and transform it into coke, as much as 3 per cent. may be obtained. Anthracene thus manufactured is, however, mixed with such quantities of chrysene and pyrene that its purification becomes very difficult, and this thorough distillation has had to be discontinued in England, until some application of chrysene arises of sufficient importance to manufacturers to induce them to produce it in large quantities.

When this industry is established in France on a large scale, and when anthracene comes down from the high price of 10 francs, at which it now stands, to a much lower rate, it is certain that the manufacture of artificial alizarine will assume a still greater importance, and madder will then have to sustain a more serious struggle than that in which it is at present engaged. Everything leads to the belief that the applications will be more and more investigated, and that for dyeing purposes it will henceforth hold a less restricted place than it has hitherto done. It is to the tar distillers rather than to the manufacturers of alizarine that the task of forwarding that result belongs.

The history of the discovery of artificial alizarine is one more example of the fact that inventions and industrial applications are brought to light at a given moment by purely scientific researches. In fact, in that respect, nothing has been the result of chance. It is with the guidance of a rigorous scientific method that inventors have brought to perfection their most brilliant researches. Science has not had to throw her light upon unexplained reactions; all has been brought about by deductions resting upon the highest considerations.

We have no doubt that some new and very important facts will soon be added to this beautiful series of discoveries, and that the important store of hydrocarburets to be found in coal tar holds in reserve for us some unexpected applications.

Guided by the researches of M. de Lalande upon purpurine, the manufacturers of alizarine are now turning their attention to the production, for all kinds of work, not only of that article in its pure state, but likewise artificial purpurine, and we have every reason to believe that very shortly the formation of these two colouring matters, which it is so difficult to separate in natural products, will be very greatly facilitated by reactions based upon the knowledge we now possess of their molecular constitution.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

Very little trade news of importance has transpired since my last report was penned. Everything is still sluggish and dull, with but very little actual business in course of transaction. In pig iron there have, it is true, been a few sales of both forge and foundry brands, during the past few days, but prices have not been sustained. It is stated, in fact, that in some instances a reduction of 2s. per ton has been submitted to, in order that orders might be secured. In every department of the ordinary iron trade underselling is at present the rule, every maker being obliged to get orders at some price or other, even if the quotations at which they are taken leaves him no profit. The foundries, it should be remarked, are probably exceptions to this otherwise general rule, many of the principal houses in that "line" being now fairly well engaged. The gas and water companies have lately given out good orders, and there are now several other good specifications in the field on behalf of corporations or companies in various parts of the country. Large ordinary castings range from £5 10s. to £6 10s., smaller ones being proportionately dearer. Machine castings made from good Middleton pig are £8 to £8 10s. per ton. The following are the average quotations for North Yorkshire pig iron:—No. 1 foundry, 55s.; No. 2 foundry, 53s.; No. 3 foundry, 51s.; No. 4 foundry, 50s. 6d.; No. 4 forge, grey, 50s. 6d.; No. 5 forge, mottled. 50s.; No 6 forge, white, 49s.; refined metal, 71s.; Kentledge, 60s.; and cinder pig, 40s., all net prices. Derbyshire pig is still £3 5s. to £3 8s.

You will doubtless give a report in another place of the terrific gas explosion at Leeds. The matter created great alarm at first, it being rumoured along the line that the station had been blown down by the explosion.

The coal trade, both in Yorkshire and Derbyshire, continues excessively quiet. Even at Clay Cross the miners are only working about half time. They can still earn 5s. per diem, when employed. The demand for household coals is diminishing, and will not again revive this season; hence prices are falling in all directions. The steam coal owners have adhered to old prices up to now, but as the effect has been only to futher restrict business, a fall may be looked for next month. Gas coals are held about 7s. 6d. to 9s. 6d. per ton, as may be arranged specially from time to time.

IRON AND COAL TRADES OF SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The iron trade of this district is, if possible, still increasing in dulness, and, notwithstanding the great curtailment of production which has been made during the past few weeks, stocks of both raw and finished iron are now accumulating, and the make will have to be still further restricted. Many of the works are now altogether idle, and of those which have been maintained in operation, few are at present running more than three days a week. Prices have not yet declined to any marked extent—indeed, the trade is declared to be quite unremunerative, even at current prices, especially in respect of the medium and common qualities of iron, prices for which have been reduced to a minimum by the keen and continuous competition of the north country centres of production. Sheets, singles, may now be had, in some instances, at £10 10s. per ton, and common bars at £7 15s. per ton; but for leading brands, both sheets and bars are firm at late rates.

Sheet makers of noted brands continue moderately employed, but there are now very few new specifications coming to hand, and, unless the current demand should speedily improve, makers of these qualities will soon share the general depression of the trade. Nail-making iron is now in leading request, but there is a marked decline in the demand for all classes of South Staffordshire iron.

In pig iron the market rules dull, in sympathy with the finished iron trade. Native all-mine iron is quoted from £4 10s. for hot-blast to £6 10s. for cold-blast qualities. There are now only sixty-seven furnaces in blast throughout the entire district, and it is expected that the number will be still further reduced, unless some speedy improvement in the general aspect of business should take place.

Coal is not quotably lower, though the supply is everywhere abundant, and underselling is going on to some extent. Consumers are now only buying to satisfy current requirements, and an early reduction in prices appears to be inevitable. The colliers, finding that the demand has seriously fallen off, are not so anxious to work full time as they were, and many of the pits are standing idle during the early part of each week.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

There has been a little briskening up in the demand for house coal during the last few days, owing to the colder weather, and if the frost continues this may prevent any general alteration in the Manchester list prices until the end of March, although one firm in this district has during the past week announced a reduction in house coal, and there is still no push for supplies. In other classes of fuel, there has been a moderate inquiry, and there is no particular change to notice since last week.

For gas coals, there have been one or two inquiries for next season's contracts, but they have been more in the shape of feelers than with a view to actual business at present, and the demand for this class of fuel is falling off as old contracts are worked out. Late prices, however, are generally maintained.

In the outside districts there is some underselling to secure orders, and in the South Lancashire coal-fields prices for round coal have been gradually working downwards. Best Arley at the pit's mouth can now be bought at 13s. per ton.

Pemberton four-feet is offering freely at 11s. to 11s. 6d., and common coal at from 8s. to 9s. 6d. per ton. In good classes of engine fuel there is less offering in the market, and prices in some quarters are a trifle stiffer. Good burgy at the pit is tolerably firm at from 6s. to 6s. 6d. per ton, and good slack at from 4s. to 4s. 9d. per ton, but there is still a good deal of the inferior slack offering at low prices.

The pits in many cases are now working short time, in order to prevent the accumulation of stocks; the usual practice being, that when there are no waggons in the sidings to be filled, to stop the winding of coal.

In the iron trade, business continues very depressed, with a weakening tendency in prices. Local brands of pig iron can be bought for less money than last week, and Middlesbrough iron is still being offered at very low prices, but the buying is confined to small lots for immediate requirements. In manufactured iron, Lancashire bars, delivered in the Manchester district, are offered at £7 15s.; Sheffield ditto, at £7 17s. 6d.; and Staffordshire ditto, at £8 per ton. Other descriptions of finished iron remain without change.

Both forge proprietors and founders are very slack, and, in many cases, have very great difficulty in keeping their works going.

During the week, the failure of Mr. Joseph Twibill, of Manchester, maker of the Twibill Fuel Economizers, has been announced, with liabilities amounting to £25,000, and other firms in the local iron trade, with whom he was connected, are expected to follow.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The demand for best gas coals is still maintained with some degree of firmness. Several cargoes are being shipped to Italy and other ports in the Mediterranean. A very active business continues to be done by steamers in carrying best gas coals to London, especially from the Tyne Docks, and there is a pretty steady demand for France. Whilst there is no change in the value of best gas coals at the pits, shippers have a considerable advantage upon seaborne coal over the railways. There is such an excess of steamers beyond the requirements of the trade, that any amount of steam tonnage may be had for London, at 4s. 3d. per ton, and the same or proportional rates for other ports. The state of the market has likewise brought down the value of freights paid to small sailing ships, and shippers will have the advantage of nearly 6d. per ton upon this class of freight likewise, compared with the rates which were current at the beginning of the year. From the rapid way steamers load up and clear out—most of them sailing on the tide following the one on which they arrived in port—there appears to be no detention at the shipping places. A good deal of second-class coal continues to be sent by steamers to the ports in the English channel, France, and Holland, upon consignment, and the cargoes are sold at the prices current at the place of delivery. This necessarily makes quotations very irregular—indeed, impossible; for prices are not regulated by the sales at the pit's mouth, but according to the requirements of the open market at the ports to which cargoes are consigned. The award of Mr. Hopwood, Q.C., the umpire chosen by the arbitrators in the Durham miners wages case, will be made this week.

A change has taken place in the steam-coal trade since our last impression. One or two leading collieries have only made a reduction of 1s. per ton; but most of the other pits, working first-class steam coal, have come down 1s. 6d. per ton. This is not all, however. What may be called a "ring," which was kept up in the trade to regulate prices, has been broken up thereby, and every pit now will sell its coal according to its requirements. The household coal trade is without much change.

The Cleveland iron trade gives no signs of improvement. There is an increase in the makers stocks of pig, and there is a falling off of shipments. The finished iron trade is very flat. Founders, however, are busy, and engineers and shipbuilders are fairly off for work. There is a tolerably good demand for coke. A reduction has been made upon the wages of chemical workers of 7 per cent. The chemical market, however, is extremely dull, and, generally speaking, the manufacturing trade of the northern rivers is without animation.

The directors of the gas and water companies in this district are preparing for the annual meetings. The dividends which are likely to be declared will be equal to those of former seasons. Mr. R. B. Sanderson, the chairman of the Newcastle and Gateshead Water Company, who lost two daughters by the Abbots Ripton accident, and was, with Mrs. Sanderson, very badly, and it was feared, fatally injured, we are glad to say is recovering very well from his extensive injuries.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

At the last meeting of the Police Commissioners of Dumfries, a report was submitted from the Lighting Committee, on the subject of gas-testing apparatus for the burgh. It stated that the attention of the committee had been called to the urgent necessity of having, as in many other towns, suitable means of ascertaining the quality of the gas supplied to the public lamps, and the general public; and one of the members of the committee stated that he was prepared, on behalf of a large number of subscribers, in the event of the Commissioners of Police providing a suitable room for a gas-testing station, and taking under their control the management of the same, to furnish and present to the burgh a complete set of first-class gas-testing apparatus. That gentleman had further stated that should such testing station be established, arrangements, which were already in progress, would be completed, whereby the work of testing would be undertaken free of cost to the town. The committee approved of the proposed action, and recommanded the commission to comply with the request. After the adoption of the report had been moved and seconded, the same member of committee said the public were paying for gas of which they did not know the quality, and that when purchasing any other commodity whatever they all liked to know something of the quality of it. The subscriptions had been very easily raised, and he thought it was best, before approaching the council on the subject, and asking a grant, to test the public opinion. He had got very few refusals, and the manner in which the movement had been supported by the public fully bore out the opinion he had formed as to the desirability of such an apparatus being got and put to use. The report was adopted, and Mr. Wood, the member referred to, was heartily thanked for his exertions in the matter.

Gas-testing on behalf of the public is regularly and systematically conducted in connexion with the Corporation gas supply of the city of Perth. The results are regularly announced to the public. Those for the week ending the 4th of February are as follow:—Maximum, 28·82 candles; minimum, 26·94 candles; average, 27·89 candles. It will thus be seen that the gas consumers of the "Fair city" are being supplied with gas of high illuminating power.

The shareholders of the Wishaw Gas Company met recently to consider the advisability of extending their capital. It was stated that, in consideration of the extensive additions made to the works, an increase of capital was necessary, and it was agreed to increase it to £12,400, the consumers to have the first chance of taking up the shares.

Mr. Hawkeley, C.E., accompanied by the Messrs. Leslie, Edinburgh, recently visited the gathering-grounds at Craigluscar. He expressed himself as of opinion that nothing more could be got out of Craigluscar—that the grounds there have already been utilized as far as can be done—and that the supply of water from there may serve the town in favourable seasons. He afterwards met with the Water-Works Committee of the Dunfermline Town Council, and fully explained his views. Since then he has embodied his opinions in an elaborate report. Feeling still runs high in the town, and it is fully expected that opposition will be raised in Parliament against the bill that has been lodged by the Town Council in favour of the Glensherup scheme. The estimated cost of that scheme is £52,000.

The fifteenth annual meeting of the Rothesay Water Company was held a few days ago, when a dividend of 9 per cent. was declared. It is not unlikely that a reduction will soon be made in the rates charged to consumers.

There is now some prospect of the Lennoxtown Water Scheme being carried out, owing to the official interference of the Board of Supervision.

Within the last few days the price of pig iron has been very low. On Thursday it touched 61s. 4½d. prompt cash, and on Friday as low as 61s. 3d. cash was taken, and 61s. 6d. one month. General brands have been reduced in price 2s. per ton during the week. Coal has been very dull in demand during the last week or two, and prices have fallen in consequence.

ST. AUSTELL GAS COMPANY.—At the annual meeting of this company on the 7th inst., a dividend at the rate of 6 per cent. was declared.

INSTITUTION OF CIVIL ENGINEERS.—This evening Mr. W. Sugg will read a paper at this institution on "A New Method of Testing the Illuminating Power of Gas.

KIRBYMOORSIDE GAS AND WATER COMPANY.—The annual meeting was held on Wednesday, the 9th of February. The report was the most satisfactory ever presented. A dividend of 5 per cent. was recommended. The two retiring directors, with the auditor, were re-elected. It was resolved that the remaining 140 shares should be issued at par—in the first instance offered to existing shareholders, and to parties residing in the town.

REDUCTIONS IN THE PRICE OF GAS.—The Kidderminster Gas Company have given public notice that they have resolved (from Jan. 1 last) to reduce the price of gas to the following rates:—Consumers under 50,000 per quarter, 3s. 9d. per 1000 feet; consumers above 50,000, and under 250,000 (on such quarter), 3s. 7d. per 1000 feet; and above 250,000 (on such quarter), 3s. 5d. per 1000 feet. This is 2d. per 1000 feet reduction on each quantity. The Stroud Gas Company have just issued a notice reducing the price of gas from 5s. per 1000 feet to 4s. 9d., to take effect from the 1st of January last. At Ashbourne the price has been reduced from 5s. 5d. to 5s. At Chester there has been a reduction of 3d. per 1000. At Wotton-under-Edge the price had been reduced to 5s. 6d.

FATAL GAS EXPLOSION AT LEEDS.—On Thursday morning, about 9.30, an alarming explosion of gas occurred in the inquiry office at the entrance to the Midland Railway Station, Leeds, which resulted in a considerable amount of damage to property and injury to several persons, one of whom has since died. It is the old story of a light being used to discover the place whence the gas leaked. The deceased man, named Levi Booth, who was a guard on the Lancashire and Yorkshire Railway, was removed from the *débris* with both legs fractured, and otherwise so seriously injured that his case, from the first, was hopeless, and he expired in the infirmary on the following day. The inquest will be held to-morrow.

PICKERING GAS SUPPLY.—At the meeting of the Pickering Local Board on the 7th inst., Mr. J. Watson, Mr. J. D. Whitehead, and Mr. Tomlinson (engineer of the newly-formed gas and water-works company), attended as a deputation to ask the board that, in the event of the company applying to Parliament for powers, they should not be opposed. Mr. Tomlinson explained that they intended to ask for power to take the gas at the present charge, that future prices should be fixed by arbitration, and that the company should have the exclusive right to supply the town with gas and water. After considerable discussion, it was agreed that the engineer should submit to the board a draft of the powers proposed to be asked for at their next meeting.

WHITBY WATER-WORKS COMPANY.—The twenty-fourth general meeting of this company was held on the 8th inst.—Mr. Thomas Thistle, chairman of the company, presiding. The report showed a disposable balance of £1737 5s. 7d., and the directors recommended that a dividend of 9½ per cent., or 19s. per share, on the fully paid-up shares, and 9s. 6d. per share on the shares on which £5 is paid, be declared, free of income-tax. This absorbs £1665 16s. 6d., leaving a balance of £71 19s. 1d. to be carried forward to credit. The report was unanimously adopted. Mr. W. Wright, one of the directors, having resigned, Mr. James N. Clarkson was elected in his stead. Mr. J. Rowland, auditor, was reappointed.

CLEVELAND WATER-WORKS COMPANY.—On Monday, Feb. 7, the half-yearly ordinary meeting of this company was held at the company's offices, Saltburn. Mr. J. T. Wharton, of Skelton Castle, presided. On the motion of the chairman, seconded by Mr. Whitwell, it was unanimously resolved that a dividend at the rate of 10 per cent. per annum, and a bonus of 3s. per share on the original shares, be declared payable, free of income-tax. The retiring director and auditor were re-elected, and the remuneration granted to the directors was unanimously increased. The ordinary business having been concluded, the meeting was made special, to consider the bill promoted in Parliament, intitled "A Bill for extending the limits within which the Cleveland Water Company may supply water, for empowering them to construct additional works, and to raise additional capital, and for other purposes." The bill was unanimously approved, and a vote of thanks to the chairman terminated the proceedings.

PRESENTATION TO MR. BLACK, OF GRAHAMSTON, N.B.—On the 4th inst. a number of the friends of Mr. Black, gas manager, Grahamston, met in the "Red Lion Hotel," for the purpose of presenting him with a testimonial on the occasion of his leaving for South America. Mr. Duncan occupied the chair, and made the presentation. Mr. Black, he said, during the two years he had been in Grahamston, had acted to the satisfaction of all, and in parting with him they sustained a decided loss. He then, in the name of the subscribers, handed over to Mr. Black the testimonial, which consisted of a handsome gold watch and a box of drawing instruments. He was also presented with a gold ring for Miss Black. The watch bears the following inscription:—"Presented to P. A. Black, by a few friends, on the occasion of his leaving Falkirk for Callao, South America. Feb. 4, 1876." Mr. Black, in returning thanks, said that the gifts now presented to him would ever keep him in remembrance of the many friends he had in Falkirk, and they would nerve him to do his duty. He expressed his gratitude to the subscribers for himself and his sister, who, he assured them, would prize her gift very much. Song and sentiment followed, and a very pleasant evening was spent.

GLASGOW CORPORATION GAS EMPLOYÉS SOIRÉE.—This annual gathering was held in the City Hall on the 10th inst. The Lord Provost Bain occupied the chair, and there was a large attendance of members of the council and others. Mr. Foulis, the engineer, and Messrs. Manwell, Davidson, and Key, the station managers, were also present. The Lord Provost, in addressing the meeting, expressed the great pleasure he had in presiding and seeing so many happy faces around him. As chairman of the Corporation Gas Trust, he thought he might say something of the great work in which they were interested. In the Corporation Gas-Works, from which Glasgow and the vicinity were supplied with gas, there was £1,016,000 invested. There were 400 miles in length of pipes laid in and around the city, distributing gas through 317,500 meters. The number of workmen employed during the winter season was 1309. He said he was very particular about the nine, because he included in the 1309 the 50 Town Councillors, who all worked hard in every matter connected with the Corporation and for the interest of the citizens. The quantity of gas made in the year amounted to 165 million cubic feet. In these days of education a good many knew that the distance of the moon from the earth was 240,000 miles. Well, the quantity of gas made in the year, if put into a pipe 12 inches round, would stretch from that hall to the moon and 7000 miles beyond it, or it would go thirteen times round the globe. His lordship said that at such meetings it was expected that the

chairman should give a few words of advice, and in doing so he would be very short and explicit. He would advise all to be temperate in all things—in their speech as well as in eating and drinking. If a man could not drink without occasionally getting drunk, the sooner he became a total abstainer the better. It would be much better for him to put his money into the savings bank than into the gill-stoup, and when he once had it in the bank he could look upon it as so much kept out of the publican's till, which would be of use to him in after life. One other point he would urge upon them was to attend a place of worship every Sunday; and to read instructive books and newspapers. It was of very great importance at the present day, when newspapers were so cheap, that they should be fully conversant with the events of the day. He should like to see in Glasgow what existed in Liverpool, free libraries and reading-rooms, not only for men, but for women as well. He would add one word about conduct. He did not see why there should not be as much politeness and consideration given to the feelings of others by a man in a moleskin jacket as by a man in the finest broadcloth; but such did not exist. Sometimes in going home he met a band of workmen coming from their work—he did not believe any of them came from the gas-works—and heard them indulging in language quite the reverse of delicate, and taking the whole of the pavement to themselves, and sending women and children into the muddy streets. To the young women present he would say that they could exercise a great amount of influence over the young men, whom they could captivate at their will. He enjoined them to have nothing to do with any young man, however good looking, if he was a drunkard and a curser and swearer. In conclusion, he wished to remind them that

> Honour and fame from no condition rise;
> Act well your part, there all the honour lies.

Addresses were delivered in the course of the evening by Bailie Collins and Councillor Dron, and the proceedings were agreeably diversified with songs by a number of *artistes*. There were about 1150 tickets sold for the assembly.

Birmingham Corporation Water-Works.—At the quarterly meeting of the Birmingham Town Council on the 1st inst., the report of the Water-Works Committee was read by the chairman, Alderman Avery. It stated that on the 1st of January the conveyance of the water company's undertaking to the corporation was duly sealed and attested, and annuity certificates, representing a total annual amount of £54,491, together with a cheque for cash payments amounting to £3022 1s. 6d., were handed to the chairman of the company. At the same time a cheque was paid to the corporation by the chairman of the company for the balance of £16,072 11s. 1d., remaining to the company's credit at the bank, and the purchase was then completed. The title-deeds to the company's estates were also delivered by the company's solicitor into the custody of the town-clerk, and the committee, on behalf of the corporation, then formally entered into possession of the works and undertaking of the company. Instructions having been given to the borough treasurer to issue a circular to the shareholders of the water-works company, proposing to purchase their respective annuities at 24 years purchase, upon their consent being signified on or before the 21st of December last, the shareholders who accepted the proposal represented annuities for the annual amount of £568 11s. 3d., and such annuities have been redeemed by the payment of the sum of £13,645 10s. After announcing the arrangements made by the committee in reference to banking and other details, the report stated that the late water-works company had commenced proceedings against the Aston Local Board of Health and Messrs. Carter and Co.; and that the Aston Local Board have subsequently constructed some extensive sewerage works for the discharge of the contents of the sewers into the Tame, and as such operations may seriously imperil the efficiency of the water department of the corporation, the committee propose, subject to the approbation of the council, to continue such suits, and to adopt such further measures as they may from time to time be advised will be necessary for the protection of the property and the rights of the corporation. In moving the adoption of the report, Alderman Avery enlarged upon several of the points referred to by the committee. Amongst other things he stated that, though the committee had taken possession of the undertaking of the company for so short a period, yet the information that they had been able subsequently to acquire confirmed them in the view they originally adopted, and which was approved by the council, as to the terms on which the undertaking had been acquired, and the prudence and expediency of avoiding the perils of an arbitration. The most careful estimates of the income and expenditure for the year 1876 had been made and forwarded to the borough treasurer; and it appeared, though they could not, of course, tell what eventualities might occur, that the income from the water-rentals would be equivalent to the whole expenditure, and there would be no charge upon the rates for the first year that the undertaking was in the hands of the corporation. In a commercial sense, therefore, the operation ought to be satisfactory to the ratepayers, whilst in a sanitary sense its advantages were so obvious that it was hardly necessary to speak of them.

Halifax Corporation Gas-Works.—At the meeting of the Halifax Town Council on the 2nd inst., the quarterly report of the Gas Committee was presented. It stated that the quantity of gas made during the past quarter was 102,605,000 cubic feet, as against 94,914,000 cubic feet for the corresponding quarter of 1874, being an increase of 8,691,000 cubic feet. The quantity of coal used was 7580 tons, as against 6072 tons. The quantity of cannel used was 2870 tons, as against 4423 tons. The total quantity of coal and cannel used was 10,450 tons, as against 10,495 tons, showing a decrease of 45 tons. The amount of the cost in wages for manufacture and distribution was £2145 19s. 6d., as against £2326 17s. 5d. for the corresponding quarter of 1874, showing a decrease of £180 17s. 11d. The average illuminating power of the gas had been 17·40 sperm candles, as against 15·66 sperm candles for the corresponding quarter of 1874, showing an improvement equal to 1·74 sperm candles. The committee had pleasure in reporting that the coal had been supplied in a very satisfactory manner during the winter months. Probably owing to the very fine weather, the coke, though reduced in price, did not sell so freely as the committee would like. Very favourable offers for the purchase of the surplus tar up to the 31st of October next, had been received, and were now under the consideration of the committee. The works, on the whole, were in a very satisfactory condition, and though the price of gas for the present year was only 2s. 8d. per 1000 cubic feet, the committee would, to the best of their power, keep up the illuminating power of the gas and the efficiency of the works. They trusted the results would be satisfactory in a pecuniary sense. At a meeting of the committee held on the 28th of January, a resolution was passed recommending the following report for the adoption of the council:—"The sub-committee appointed by the Gas and Finance Committees, for the purpose of examining the capital and revenue accounts of the gas-works belonging to the Halifax Corporation, beg to say that, in accordance with their instruction, they have made such inquiries as they considered necessary, both from the books and from persons, who, from their long experience, possess the most practical knowledge of the gas-works; and, after careful consideration, they now report that, in their opinion, the capital account of the gas-works is too high, and unanimously decide to recommend that the same be reduced by the sum of £35,000, to be written off at the discretion of the Gas and Finance Committees, but at the rate of not less than £3000 per annum." Having just received the returns for the last year, the committee found that the quantity of gas made during the year was 264,038,000 cubic feet, as against 246,912,000 cubic feet for the previous year, being an increase of 17,126,000 cubic feet, or 6·93 per cent. The total profits for the year amounted to £12,378 16s., and the committee, in dealing with the same, resolved that the sum of £4500, the amount of surplus balance of gas profits, be appropriated to the reduction of the capital account. The proposal to reduce the capital account was protested against by Mr. T. Smith, on the ground that such an appropriation of profits was contrary to the Act. After considerable debate, the mayor promised to lay the point of law before the town-clerk, and, having obtained his opinion, to call a special meeting of the council to consider the question.

Entertainment to the Employés of the Dundee Gas Commission.—On the 2nd inst. the eighth annual festival of the persons employed by the Gas Commission was held in the Union Hall, Dundee—Mr. M'Crae, the manager, presiding. After an excellent tea, the chairman expressed the pleasure he felt in being present at such a meeting, and gave a hearty welcome to the men and their wives. He did not intend to speak of the past year as to whether the concern was paying or not; but on this occasion they could pleasantly and profitably speak of their social relationships, and he could not but remark that every year the men, with their wives and families, presented an improved aspect in increasing numbers and pleasing countenances, and he trusted these results proceeded from higher principles. It was his duty and place to say, that never, during the nine years he had been manager of the Dundee Gas-Works, had the conduct of the men been more successful and satisfactory than in the year just closed. No doubt there was now and again a breakdown. He felt grieved for the man and his family in such a case; while, on the other hand, when he saw them persevering in their duties, he was sure it was good for the men, their families, and for the town of Dundee. He believed there was no gas establishment in Great Britain where the breakdowns were so few as was the case in Dundee. They heard of trades unions and strikes, and when he read of these, he thought there was a union of employers and employed which was too often neglected—the union of kindness. He was an *employé* himself, and would not like his employers to act unkindly to him, and that should teach him to act kindly to those he employed. It would be better if there was that kind of sympathy and attention to each other's interests prevailing in the world, and he hoped it was so in their establishment. If a man took an interest in his work, he would take an interest in all that was about him; it made the work pleasant, and was more easily done when done cheerfully. The man was as honourable in a mean position, when he did his duty faithfully, as any other man; and he (the chairman) was thankful these duties had been performed more faithfully the past year than they had ever been before. Ex-Bailie Maxwell, in the course of a brief address, said the *employés* of the Gas Commission were most respectable men—men who stood high in the working class, and were deservedly held in respect. In regard to his worthy friend the chairman, he could not help saying how gratifying to him, as a gas commissioner, was the esteem in which he was held, and this was supported by the respect in which the men themselves held him. He knew of no place where the connexion of employers and employed was so thoroughly maintained. During the evening, a reading, and several songs and duets were admirably rendered by members of the company. Selections of instrumental music were also performed on the concertina, violin, pianoforte, ending with the martial strains of the bag-pipes. Three hearty cheers were given for the Queen, and the meeting concluded, shortly after ten, by the whole company singing "Auld Lang Syne."

Register of New Patents.

602.—Williamson, W. B., Bradford, "*A new or improved system and means of preventing the pollution of rivers, and extracting and carrying away the noxious vapours from sewers so as to prevent deleterious effects therefrom.*" Patent dated Feb. 18, 1875.

This invention has for its object the construction of a united system of drainage or sewerage, which consists of one main drain or culvert formed (by preference) of brick and mortar made water-tight, and taking the most suitable course to the sea coast, and extending to some suitable distance over the sea at some feet of elevation above high water, which may be done by forming a pier. In connexion with such drain or culvert, ventilating shafts are constructed to carry off the noxious vapours into the higher atmosphere. Near the several towns to be drained, branch drains are made and connected with the main drain or culvert.

622.—Speir, R., Greenock, and Mather, J., Gateshead-on-Tyne, "*Improvements in the manufacture or production of gas for illuminating or heating purposes, and for actuating gas-engines.*" Patent dated Feb. 20, 1875.

This is a development of the invention set forth in the provisional specification of these patentees, No. 4386, A.D. 1874.

One or more jets of air or gas are passed across the orifice or orifices of a pipe or pipes which dip into a reservoir containing oil or spirit capable of being burned, such as paraffin oil, petroleum, or the spirits of these oils and other inflammable oils or spirits. In this manner a spray of air or gas, highly charged with inflammable oils or spirits in a finely divided state is produced, which may be used at once for lighting or heating purposes by burning it directly as it issues from the nozzles or by forcing it through pipes to the point where it is to be utilized, or thus charged it may be passed through a retort or pipes highly heated, so that the hydrocarbons are revolatilized therein and the mixture converted into a permanent gas.

By means of the spray-producing apparatus and by the regulation of the quantity of air used in the production of the spray, hydrogen or compounds of hydrogen or other substances may be made so as to produce a gaseous compound of highly explosive qualities, which may be used for actuating motive-power engines.

The illuminating power of a gas is also improved under this invention by using it to produce the spray.

When using the invention for heating boilers or for firing, puddling, or other furnaces, the jets may either be thrown upon a layer of slowly burning coals, or a nozzle or pipe or series of nozzles or pipes may be directed into or carried over or through the furnace, whereby one or more jets of flame are caused to play upon the surface of the boiler or within the furnace so as to impart heat thereto and to the materials thereon.

The air employed may be cold, or it may be heated if desired by heat from the furnace or other apparatus in conjunction with which the invention is used, or by other equivalent means.

Carbonic oxide and hydrogen may have a high illuminating power imparted to them by forcing them through the spray-producing apparatus, the tank or reservoir of which is charged with oils or spirits of the classes set forth.

625.—Morgan, O. T., Kensington, and Moelchaerek, G. R., Battersea, "*Improvements in filtering and purifying water.*" Provisional protection only obtained. Dated Feb. 20, 1875.

This invention consists in the special use of calcium carbonate in addition to or in combination with other filtering media, either as forming part of the filter or in the form of cups or vessels to be used in conjunction with filters of any description, or by themselves, and is more particularly adapted for the purpose of removing lead from its solution in water to be filtered.

649.—Rowley, S. H., Swadlincote, "*Improvements in water-closets.*" Patent dated Feb. 22, 1875.

This invention refers to those closets which have an outlet-pipe at the side of the basin, and in which a certain amount of water remains at the bottom of the basin, not to form a seal, but to receive the soil, and consists in admitting the whole or the greater part of the flushing water to the basin at a point diametrically opposite the outlet, so as to ensure the contents of the basin being carried off.

660.—Bates, G., Lewes, "*Improvements in apparatus for attaching main-cocks valves, plugs, or other connexions to service-pipes for water when under pressure.*" Patent dated Feb. 23, 1875.

This apparatus for opening out the ends of service-pipes without shutting off

from the main, consists of a tube to pass over the end of pipe, fitted with a stuffing-box through which spindles are passed to open out the pipe, and also to plug the end while a top valve or union is being soldered or screwed in, which may be done while full pressure is in the pipe.

668.—NEUHAUS, M., Strand, London, "*Improved means and appliances for the production of lighting and heating gas from air and spirituous vapour combined.*" Patent dated Feb. 23, 1875.

This invention consists in causing a current or several currents of air to issue under pressure from one or more chambers in a vertical direction, and to draw through nozzles a liquid body by which it can become impregnated with the vapour in a state of spray or fine division, such impregnated air being afterwards used for lighting and heating purposes like ordinary coal gas. The jets of air and liquid combined are thoroughly disseminated and as the liquid portions in excess fall, they, while still in a state of spray come into contact with the rising currents, consequently a perfect saturation of the air is established,

The apparatus consists of three vessels, which may be kept a reasonable distance apart, and connected by pipes, or they may be so arranged in one casing that combined they occupy very little space. The first vessel is a blower, pump, or the like, by which a powerful current or supply of atmospheric air at the ordinary or at a heated temperature can be forced into, say, a series of semi-spherical or other shaped vessels. The top of the shell of each of these is pierced with a hole in which a nozzle outlet is fitted for the spirituous liquid to be sucked through by a ring-shaped current of air issuing from the vessel all round the nozzle. The lower ends of the nozzle-pipes are preferably cone-shaped, and dip into the liquid, the level of which is maintained automatically from a reservoir, the quantity flowing therefrom being in proportion to the draw off by the current up the nozzle arrangement, the flow being regulated thereby like from a bird fountain.

The supply of air and vapour are always in excess of the consumption, consequently the upper part of the chamber, in which the sprays are, forms a reserve and establishes a constant steady flame. The upper part of the vessel may be divided by a partition, and the upper part could then form a reserve chamber to prevent the flame partaking of any variable action from the blower or the pump as the case may be. The reservoir has a false bottom, and the supply of liquid from the upper part into the lower is governed by a valve which can be closed when desired by screwing down a plug-key, the plug being in connexion with a lazy-tong arrangement of levers, or knuckle-joint levers on the outside, so that when the reservoir requires recharging the plug can be closed to shut off the passage, the filling nozzle can then be removed and the reservoir charged, the burning of the vaporized air going on at the same time without danger.

In some cases an open connecting-pipe is fitted to the lower chamber of the reservoir, and to the spray chamber, through which a certain quantity of vaporized air can pass from one to the other. This pipe serves also to return the accumulated fallen liquid back to the lower chamber of the reservoir when sufficiently high to flow over the top edge of it. The top of the pipe may, however, be bent downwards so as to dip into the accumulated liquid, and thereby to seal the joint against any air passing into and pressing upon the liquid in the lower reservoir chamber. There is preferably only a sucking action of the air from the semi-spherical vessels for the liquid to rise up and issue at the nozzles for a distribution in the shape of spray, and an impregnation of the air by the liquid while both are in a combined and sprayey condition in the chambers.

Between the spray chamber and the outlet for the gas a diaphragm of any absorbent of moisture material is fitted, through the pores or meshes of which the air charged with vapour can pass, the diaphragm serving to prevent the escape of the liquid, and to render the gas comparatively dry and fit for burning without leaving a deposit.

678.—WIRTH, F., Frankfort-on-the-Maine, "*Improvements in stop-valves.*" A communication. Patent dated Feb. 24 1875.

This invention consists, first, in a closing arrangement in combination with two conical pieces, the surfaces of which are parts of a circular cone or of any other rotating body. Second, in the pressing of the conical pieces in their seats by means of a wedge which only follows the upward and downward movement of a vertical spindle, but not its rotating movement.

681.—JOHNSON, J. H., Lincoln's Inn Fields, "*Improvements in the treatment of gases, liquids, and pulverulent substance, and in the machinery or apparatus employed therein.*" A communication. Patent dated Feb. 24, 1875.

This invention relates to the application of centrifugal force for bringing into contact the molecules of various bodies (gaseous, fluid, or in a pulverized condition) in order to obtain in a continuous manner and in a limited space considerable acting surfaces, and thus to facilitate, by its acceleration the absorption or the separation of the elements composing a mixture of gases, fluids or pulverulent substances.

693.—STOREE, J., Birmingham, "*Improvements in water-closets.*" A communication. Patent dated Feb. 24, 1875.

According to this invention the water supply cock is opened and closed by a weighted lever actuated by a second weighted lever, which latter works the tilting pan of the basin, to which it is connected by a slotted arm and pin. The weight of the tilting-pan lever serves to couple it to the hand-rod, by the lifting of which the mechanism is brought into action. The combined weight and coupling is capable of being adjusted on the end of the tilting-pan lever both vertically and horizontally, and the hand-rod is coupled to the weight by a kind of ball-and-socket joint which permits the weight to turn freely on the lever without obstruction to the proper working of the other parts of the mechanism.

696.—QUICK, J., junior, and RESTLER, J. W., Great George Street, Westminster, "*Improvements in meters for measuring liquids.*" Patent dated Feb. 25, 1875.

According to this invention two pistons connected by a rod are caused to travel to and fro under the action of inflowing liquid or fluid, the pistons acting in their travel alternately against one or more slide-valves fitted in a partition to cover and uncover the inlet and outlet ports automatically for the passage of the liquid in the proper direction. The movement of the pistons or of the valves actuates the registering apparatus, which indicates upon dials the number of times the pistons have moved, and consequently the quantity of water passed through the apparatus.

The outer casing of the apparatus is partly cylindrical and partly D shaped. In the cylindrical parts are arranged pistons (packed as usual to make them water tight), these being connected on their inner faces by a rod which is free to move in a partition, the length of which determines the distance the pistons shall travel to and fro.

The top half of the partition has a double valve fitted in it, this being free to be moved "end on" by the pistons as they alternately come into contact with it, which they do by the pressure of the inflowing liquid. The inner valve is tubular, and has ring projections upon the exterior, between which passages are formed for leading the liquid or fluid into and from the inside, according to the position for the inlet or the outlet. The valve works within a kind of box, also formed with passages or ports between rings upon its exterior, one port being always open to the supply, and one for each piston being always open to the outlet from the casing. The box moves to and fro under the action of the water admitted by the inner valve, which acts upon the area of the valve and box, the two, that is the valve and the box, then moving together. The box is limited in its travel by stops fitted in the casing. The inner valve is so fitted that the first movement by the piston puts one of its rings over and past the inlet from the supply; the water then acts against a division plate of the valve, and under that pressure it continues its motion until its outer ring presses against the cap on the end of the box, when they both travel together as one, the box shutting up one port which leads from the outer face of, say, No. 1 piston, and another port which leads from the inner face of, say, No. 2 piston, at the same time opening a port for the supply to go to the inner face of No. 1 piston, and the box also to the outer face of No. 2 piston, both pistons being acted upon by pressure upon the outer and inner faces alternately to move them over.

In some cases there is fitted a ringed sliding valve (not tubular) within, say, the top half of the partition, and a ringed tubular sliding valve within, say, the lower half of the partition, and inlet and outlet passages are arranged in the partition for the liquid to pass from one valve to the other. The first of these valves is an equilibrium, and when the second valve is pushed along by the action of the piston from one side, a portion of the water from the inlet port of the tubular valve passes to the back of the equilibrium valve. The pressure from the opposite end having by this time been removed, consequently the equilibrium valve is moved over, whereby a closed outlet port is opened on one side and an open outlet port is closed on the other side, the action being alternate, and put in force by the movements of the tubular valve under the action of the pistons.

Also in some cases in the partition are fitted two valves, the one smaller than the other, the larger working independently of the pistons, but under the alternate admission and release of the fluid acting upon its ends. The motion of this valve, and consequently the flow of fluid to and from the measuring cylinders, is governed by the smaller valve, which is acted upon by the pistons. In this case the larger valve, instead of being connected only with the ports leading to the outer ends of the cylinders, is connected to the inner ends also by extending the port from the outside of, say, No. 1 piston to the inside of No. 2, and from the outside of No. 2 piston to the inside of No. 1. In this case the body of the meter is made cylindrical for its whole length.

721.—KELEN, L. Van der, Brussels, "*An improved gas-stove.*" Provisional protection only obtained. Dated Feb. 26, 1875.

In these improvements the air chamber is made of a conical form in order to present a large surface to the action of the heat from the burner, which is of a novel construction, and the air introduced into this chamber will be thoroughly heated before it passes into the apartment. The upper end of the air chamber is left open, but an ornamental perforated cover may be adapted to the outer casing.

734.—CHAMBERS, A., Marylebone Road, London, "*Improved apparatus for facilitating the ignition of gas in the lamps of railway carriages.*" Provisional protection only obtained. Dated March 1, 1875.

This invention consists in connecting together the several lamps in a carriage or train of carriages by perforated pipes combined with deflecting guard plates, by which flame is communicated from jet to jet when the gas is turned on in the perforated pipes, so that all the lamps in a carriage or train may be readily lighted by turning a cock and applying a light at a single point. Sometimes an external light is dispensed with by applying gas or other lights arranged in chambers in proximity to the perforated pipes, so that to light the lamps it is only necessary to turn a cock. The cocks of the lighting mains are arranged to close automatically.

737.—KEIRBY, J. E., Swinton, Lancs., "*Improvements in elastic and other pakings for pistons and piston-rods of steam-engines, pumps, rams, and other similar purposes.*" Patent dated March 1, 1875.

The features of novelty in this invention consist in combining a metallic wire-work exterior with the elastic and other descriptions of packing used for the glands of piston-rods, for packing pistons, and for other similar purposes, which is effected by lapping, braiding, or plaiting these descriptions of packing with thin metallic wire, by preference copper, whereby such packing is rendered more durable, and friction is considerably reduced.

744.—DICKSON, J. F., Leicester, "*Improvements in air and gas engines or motors.*" Patent dated March 1, 1875.

According to these improvements the piston-rod has a double rack, one to gear into a wheel on the main shaft for the upward or downward stroke, and the other into another wheel, double the size of the former, for the downward or upward stroke, the latter wheel acting through the intermediation of other wheels upon the main shaft, whereby a continuous motion of the main shaft is established without variations of speed.

761.—LAKE, W. R., Southampton Buildings, London, "*Improvements in apparatus for regulating the flow of gas, steam, or air.*" A communication. Patent dated March 2, 1875.

According to this invention an elastic diaphragm chamber or a plunger is secured in a suitable shell or casing, provided with openings for the ingress and egress of the gas or other medium, and to it is secured by suitable gearing, a valve which is automatically arranged to open and close an orifice or opening in or which shall lead to the supply pipe.

APPLICATIONS FOR LETTERS PATENT.

460.—SIVAL, D., Lyons, France, "An improved mechanical regulator applicable to several purposes." Feb. 4, 1876.

497.—MASON, C., Southampton Buildings, London, "Improvements in and relating to valve apparatus for steam-pumps and other purposes." Feb. 8, 1876.

499.—KÖTTGEN, F. W., Barmen, Germany, "An improved pumping-engine." Feb. 8, 1876.

508.—NEWTON, A. V., Chancery Lane, London, "Improvements in centrifugal pumps." A communication. Feb. 8, 1876.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

2801.—DODD, J., Liverpool, "Improvements in ventilating water-closets, soil-pipes and traps of same, also in 'flushing rims' applicable to water-closet basins." Aug. 9, 1875.

2842.—SUGG, W. T., Westminster, London, "Improvements in apparatus for the storeage and supply of gas." Aug. 12, 1875.

2884.—WIRTH, F., Frankfort-on-the-Maine, Germany, "Improvements in water-meters." A communication. Aug. 16, 1875.

3749.—TIMME, H. F. O., Basinghall Street, London, "Improvements in mechanism or apparatus for raising and lowering chandeliers and other similarly suspended objects or bodies." A communication. Oct. 28, 1875.

4083.—THORNELOE, G., Barbican, London, "Improvements in gas, water, and steam valves." Nov. 24, 1875.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

220.—HAWKINS, J. G., "Improvements in the apparatus used in the manufacture of gas." Jan. 18, 1873.

248.—ROBERTSON, J., "Improvements in machinery or apparatus for forcing, exhausting, or measuring air, gas, or other fluids or liquids." Jan. 21, 1873.

257.—NEWTON, A. V., "Improvements in apparatus for applying steam to the raising and forcing of water and other liquids." Jan. 22, 1873.

314.—GIRDWOOD, R., "An improved portable apparatus for illuminating by means of gas." Jan. 27, 1873.

385.—BROEL, J., "Improvements in apparatus for lighting and heating." Jan. 31, 1873.

389.—PLATT, G., "A new improved mode of imparting ornamental effect to chandeliers, branches, and other ornamental gas-fittings, and which said improvements are also applicable to chandelier and general fittings, the means of illumination being otherwise than that of gas." Feb. 1, 1873.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION has been AWARDED to

GWYNNE & BEALE'S PATENT IMPROVED GAS-EXHAUSTERS,

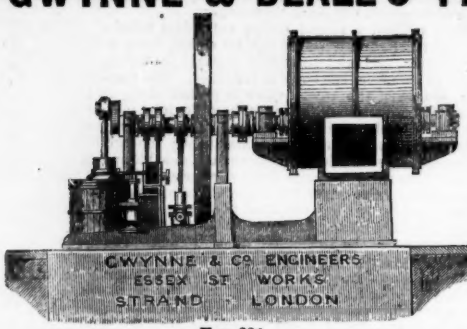


FIG. 224.

The BEST EXHAUSTERS IN THE WORLD.

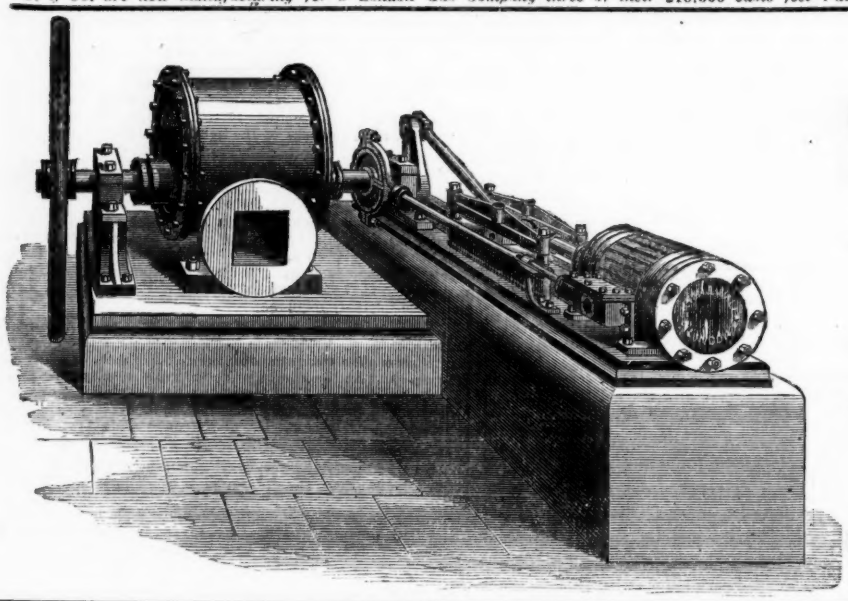
GWYNNE & CO.
HAVE MADE THE
LARGEST AND MOST PERFECT
EXHAUSTING MACHINERY
Ever produced, and the most economical in working.

Prices and every information on application.

FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND Co. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES,
CAN BE HAD ON APPLICATION TO
GWYNNE & CO., HYDRAULIC & GAS ENGINEERS, ESSEX STREET WORKS, STRAND, LONDON, W.C.
G. & Co. are now manufacturing for a London Gas Company three of their 210,000 *cubic feet Patent Gas Exhausters, and many of all sizes.*



BEALE'S
Improved Patent
GAS-EXHAUSTERS
WITH
ENGINES COMBINED.
Sole Makers,
GEORGE WALLER & CO.

Makers of
ENGINES, EXHAUSTERS,
INDEX and DISC GAS-VALVES,
HYDRAULIC MAIN VALVES,
BYE-PASS VALVES,
TAR, LIQUOR, and other PUMPS,
SCRUBBERS and PURIFIERS,
CONDENSERS, BOILERS, &c.

PHŒNIX ENGINEERING WORKS,
HOLLAND STREET, S.E.,
AND
STROUD, GLOUCESTERSHIRE.

D. BRUCE PEEBLES & CO.,
ENGINEERS,
FOUNTAINBRIDGE WORKS, EDINBURGH,
MANUFACTURERS OF WET AND DRY GAS-METERS;
Patentees and Sole Manufacturers of PEEBLES' LAMP-GOVERNORS,
ABOVE 30,000 OF WHICH ARE NOW IN USE.
"These Lamp-Governors are so superior that they are likely to supplant all others."—*Dr. Wm. Wallace, F.R.S.E., F.C.S.*
D. BRUCE PEEBLES AND CO., FOUNTAINBRIDGE WORKS, EDINBURGH.

WANTED to purchase, Two second-hand PURIFIERS, with valves and lifting gear complete. Connexions 4-in.
Particulars to be sent to P. SIMPSON, RUGBY.

WANTED, for small Gas-Works at Waterbeach, Cambs, a WORKING MANAGER. Must understand main-laying, fixing, and taking meters. A good house and garden, with fuel and light. Wages £1 per week.
Apply to the SECRETARY, Gas-Works, WATERBEACH.

ALTON GAS COMPANY.

WANTED, by the above Company, a second-hand SCRUBBER, in good condition, with or without connexions.
Full particulars to be sent to the Manager at the works.
F. BARNLEY, Manager.
Feb. 11, 1876.

METER INSPECTOR WANTED.

WANTED, by the Darlington Corporation, a METER INSPECTOR. None need apply who have not held a similar appointment.
Applications, in own handwriting, with testimonials, stating age and salary expected, to be forwarded to me on or before the 22nd inst.
WM. SMITH, Engineer and Manager.
Darlington, Feb. 7, 1876.

WANTED, by the Advertiser, a situation as MANAGER of a medium-sized Gas-Works, or Outdoor Superintendent, Inspector, &c. Thoroughly conversant with the manufacture of gas and the general duties of a Manager, and can be well recommended by several Engineers.
Address No. 248, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

ADVANTAGES OF GAS FOR
COOKING AND HEATING.
HINTS ON GAS BURNERS, &c.
By MAGNUS OHREN, A.I.C.E., F.C.S.

Specimen Copy by post Threepence, direct from MAGNUS OHREN, Gas-Works, Lower Sydenham, London, S.E.

THE Newport (Mon.) Gas Company have for SALE a Telescopic GASHOLDER, inner lift 49 ft. diameter, outer lift 50½ ft., each lift rising 11 ft. when filled; working capacity 40,000 cubic feet, with columns, girders, counterbalancing weights, &c., complete.
The Holder is almost new, is in excellent working condition, and only removed in consequence of alterations.
Further particulars to be obtained from THOMAS CANNING, Engineer, Gas-Works, Newport, MON.
Newport (Mon.) Gas Works, Feb. 12, 1876.

GAS MANAGER.

WANTED, a thoroughly competent PERSON, to undertake the management of the Ashton Gas-Works.
Applications, in own handwriting, accompanied by testimonials, and stating age, experience, and salary required, to be sent in not later than the 19th of February, 1876, addressed to the CHAIRMAN of the Gas Company, ASHTON-UNDER-LYNE.
N.B.—Any candidate canvassing a Director or Directors of the Company will be ineligible.

ON SALE, cheap, Four second-hand PURIFIERS, 10 ft. square, with dry centre-valve and lifting gear. Thorncliffe make.
Apply to Mr. LONGWORTH, Dukinfield, MANCHESTER.

TO BE LET UPON LEASE, from the 25th day of March next, the GAS-WORKS at Herne Bay. The town is fast improving, and likely to become a very fashionable watering-place. This is an opportunity well worthy of the attention of Gas Makers. There is at present a good business attached to the works, which may be considerably increased.
For particulars apply to Mr. H. E. NEWTON, Secretary to the Company, at No. 66, Chancery Lane, LONDON.
The freehold to be disposed of if required.
Sealed tenders to be sent to the Secretary on or before the 7th day of March.

FOR SALE—Vertical Pipe Condensers, 3 in. diameter; also a number of Circular MOUTHPIECES, all second-hand, and in excellent condition.
Apply to J. HEPWORTH, Gas-Works, CARLISLE.

FOR SALE—A 6-in. Governor, in good condition. Now replaced with a larger one.
Apply to Mr. W. DUFF, Manager, Gas-Works, MORECAMBE.

TAR.

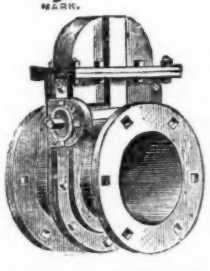
THE Directors of the Runcorn Gas Company invite TENDERS for the surplus TAR produced at their works, for a term of Three years, from the 1st day of March, 1876.
Particulars may be obtained from the undersigned, to whom tenders must be sent, endorsed "Tender for Tar," not later than the 29th inst.
J. R. FRITH, Secretary and Manager.
Gas-Works, Runcorn, Feb. 12, 1876.

THE Sheffield United Gaslight Company have for SALE the following Articles:—
The whole Manufacturing Plant, Gasholder, and Governor, of a small Gas-Work, capable of producing 10,000 cubic feet of gas per day. The gasholder is 27 ft. diameter by 14 ft. deep, cubic contents 8000 ft.
Connexions for ditto.
Four Purifiers, 12 ft. square, with 10-in. centre-valve and connexions.
Two Jones's Exhausters, each to pass 25,000 cubic feet per hour, with valves and connexions, in good condition.
Two 7-in. Governors.
One Battery Condenser, 60 ft. long, 12 ft. high, and 2 ft. wide, with 14-in. connexions and valves.
Seven Lengths Hydraulic Main, 7 ft. long, 18 in. diameter.
Nine Lengths Hydraulic Main, 7 ft. long, 14 in. diameter.
Twenty-seven Dip-Pipes, 4 in. diameter.
Twenty-seven Bridge-Pipes, 4 in. diameter.
Full particulars as to quality and price can be obtained on applying to Mr. T. ROBERTS, the Manager, Commercial Street, SHEFFIELD.

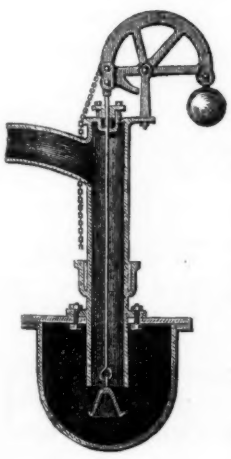
GEORGE ORME & CO.,
ATLAS METER-WORKS, OLDHAM,
MANUFACTURERS OF
WET AND DRY GAS-METERS,
STATION-METERS, GOVERNORS,
PRESSURE AND EXHAUST REGISTERS,
LAMP-METERS IN CAST-IRON BOXES,
And every Description of Gas Apparatus.

CLYDE TUBE WORKS, GLASGOW & COATBRIDGE.
OFFICES, 41, OSWALD STREET, GLASGOW,
ANDREW & JAMES STEWART,
MANUFACTURERS OF
WROUGHT-IRON WELDED TUBES AND FITTINGS,
GUN METAL & OTHER COCKS, ALL KINDS OF IRON & BRASS FITTINGS
For GAS, WATER, and STEAM;
CAST-IRON PIPES, CORE BARS for IRONFOUNDERS,
STOCKS, DIES, and TAPS, GAS PLIERS and TONGS, &c., &c.,
ALWAYS KEPT IN STOCK.
LAP-WELDED IRON BOILER TUBES,
As supplied to the English, French, and Dutch Admiralties, and principal Railways and Engineers at Home and Abroad.

B. DONKIN & CO.'S
IMPROVED GAS-VALVES
TRADE MARK.
WITH WROUGHT-IRON PINIONS,



List of prices, with full dimensions of all sizes up to 48-inch, to be had on application.
These Valves are all proved on both sides to 30 lbs. on the square inch before leaving the works, and are always kept in stock.
VALVES MADE WITH OUTSIDE RACKS TO ORDER.
ALSO, SCREW WATER-VALVES WITH GUN-METAL FACES.
ALSO SOLE MAKERS OF
J. BEALE'S NEW PATENT GAS EXHAUSTERS.
B. DONKIN & CO.,
GENERAL ENGINEERS AND IRONFOUNDERS,
MAKERS OF STEAM-ENGINES,
55a, BLUE ANCHOR ROAD, BERMONDSEY,
LONDON, S.E.



BOX'S
PATENT ANTI-DIP VALVE
Affords a clear gas way through the dip-pipe while the retort is in action, and produces a perfect seal at pleasure, or whenever the retort is open, offering absolute security against the drawing of air, however hard the engine is worked, and obviating the necessity for using any liquid in the now so-called hydraulic main, while it is at the same time capable of withstanding the heaviest back pressure. By its use, experience shows that the retorts are kept quite free from carbon. It is easy of application to existing apparatus, and is comparatively inexpensive. Is not likely to get out of order, as the tar, which will adhere to the bottom of the dip-pipe and the flange of the cone, both of which are faced, will act as a lubricant, and prevent undue wear and tear. The whole, as will be seen on inspecting the accompanying illustration, is exceedingly simple, and every part accessible. To adapt it to the present dips, all that is necessary is to face the bottom edge of the dip-pipe, and suspend a cone by a rod, which passes through the bonnet, the raising and lowering of the cone being performed through the intervention of a weighted eccentric and chain.
The Patentee will be glad to show a number of the Patented Apparatus in action, is prepared to supply them upon the most moderate terms, and will be happy to reply to any inquiries that may be addressed as under—
W. BOX,
GAS-WORKS, CRAYFORD, KENT.

IMPERIAL GASLIGHT AND COKE COMPANY.
NOTICE is hereby given that the ORDINARY HALF-YEARLY GENERAL MEETING of the PROPRIETORS of this Company will be held at No. 33, John Street, Bedford Row, London, on FRIDAY, the 25th of February inst, at One o'clock precisely, to receive the Report of the Directors and the Accounts of the Company, and to declare a Dividend for the half year ending the 31st of December last, and to elect six Directors and one Auditor in the room of those retiring from office by rotation, but who are eligible for re-election, and will offer themselves accordingly, and for other business of the Company; and further NOTICE is hereby given that a Special General Meeting of the Proprietors will be held at the same address immediately after the above Meeting, for the purpose of considering and, if so determined, of approving the following Bill, for which application is intended to be made to Parliament in the present session; that is to say, "A Bill to authorize the Imperial Gaslight and Coke Company to raise more money and amalgamate with certain of the Metropolitan Gas Companies, and for other purposes."
By order, HARRY CHUBB.
Offices of the Company, Nos. 33 and 34, John Street, Bedford Row, London, Feb. 4, 1876.

THE MITCHAM AND WIMBLEDON DISTRICT GASLIGHT COMPANY.
INCORPORATED BY ACT OF PARLIAMENT, 1867.
NOTICE is hereby given that the EIGHTEENTH ORDINARY HALF-YEARLY GENERAL MEETING of the SHAREHOLDERS of this Company will be held in the Board Room at the Works, Mitcham, in the County of Surrey, on TUESDAY, the 29th day of February, 1876, at Three o'clock in the afternoon precisely, to declare a Dividend for the half year ending the 31st of December, 1875, to elect two Directors and one Auditor.
The Directors who retire by rotation at this meeting are James John Stevens and James Page, Esqrs., who, being eligible, offer themselves for re-election.
Mr. William Russell Harwood, one of the Company's Auditors, having, pursuant to notice, resigned, the Directors unanimously appointed Mr. John Wade, Auditor *pro tem.*, and who, being eligible, offers himself for election as Auditor.
The Transfer Books will be closed from the 14th to the 29th of February inst.
By order,
BENJAMIN GREEN, Secretary and Manager.
Board Room, Mitcham, Surrey, Feb. 8, 1876.

FOR SALE, in consequence of enlargements, Two PURIFIERS, 6 ft. square, with valves grids, covers, and lifting crane complete. Also Vertical Condenser, 8-in. pipes and chest, in good order.
Apply to W. EWART, Gas-Works, ANNAN, N.B.

TO MANUFACTURING CHEMISTS AND OTHERS.
THE Carlisle Corporation Gas Committee are prepared to receive TENDERS for the surplus TAR to be produced at their works, during a term of Three, Five, or Seven years, commencing July 1, 1876. The Tar may be delivered into tanks on rails.
Any further information can be obtained from the undersigned, to whom sealed tenders, endorsed "Tender for Tar," are to be sent on or before March 9, 1876.
J. HEPWORTH, Manager.
Gas-Works, Carlisle, Feb. 12, 1876.

TO BUILDERS AND CONTRACTORS.
THE Directors of the Cleethorpes Gas Company invite TENDERS from parties willing to undertake the erection of a GASHOLDER-TANK and DRY WELL, in accordance with plan and specification, which may be seen on application to Mr. A. Downie, Gas-Works, Cleethorpes.
Tenders to be delivered to me on or before Thursday, the 24th inst., endorsed "Gas-Tank."
WM. HEAFORD DAUBNEY, Secretary.
Great Grimsby, Feb. 5, 1876.

TENDERS FOR GAS COAL.
THE Directors of the Victoria (Newmarket) Gaslight and Coke Company, Limited, are prepared to receive TENDERS for the supply (to meet present requirements) of 500 tons of best GAS COAL (21 cwt. to the ton), to be delivered at Newmarket Railway Station, in quantities of 200 tons in March, and 100 tons in April, May, and June next.
Tenders to be sent to the undersigned on or before the 28th day of February inst., to state the name and description of the coal, and to be endorsed "Tender for Gas Coal."
The Directors do not bind themselves to accept the lowest or any tender.
By order,
THOMAS WILKINSON, Manager and Secretary.
Gas Office, Newmarket, Feb. 12, 1876.

LEICESTER WATER-WORKS.
THE Directors of the Leicester Water-Works Company are prepared to receive TENDERS for the construction of a covered service RESERVOIR at Gilroes, near Leicester.
Drawings and specifications may be inspected, and forms of tender and schedule of quantities may be obtained, at the Offices of the Company, Bowling Green Street, Leicester, and at the Office of Messrs. Thomas and Charles Hawksley, Civil Engineers, 30, Great George Street, Westminster, S.W., on and after Monday, the 24th day of January inst., and tenders must be delivered at the Offices of the Company, at or before Ten o'clock in the forenoon of Saturday, the 19th day of February next.
The Directors do not pledge themselves to accept the lowest or any tender. By order,
J. H. WILLIAMS, Secretary to the Company.
Leicester, Jan. 17, 1876.

BIRTLEY IRON WORKS,
CHESTER-LE-STREET,
DURHAM.
Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.
Warehouse in London for Cast-Iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.
Agent in London, Mr. J. MANWARING, 101 Cannon Street, E.C.

WARNER AND COWAN'S
SELF-REGULATING GAS-METER,

PATENTED IN

GREAT BRITAIN, FRANCE, AUSTRIA, PRUSSIA, BELGIUM, AND THE UNITED STATES.

Original Licensees and Manufacturers: W. & B. COWAN.

The great interest which the above invention has secured, and its undoubted position as "THE GAS-METER OF THE FUTURE," induces the publication of the following particulars, showing the progress it has already made towards attaining that UNIVERSAL ADOPTION which there are the best reasons for believing it will ultimately secure :—

Only about twenty-one months have elapsed since the date of the patent, and several of these were passed in preparations for bringing the invention into public notice, and in meeting objections which, now that the principle is generally understood, and admitted to be well applied, are seen to be unfounded.

It is, therefore, satisfactory to ourselves, and must give additional confidence to our customers, to know that we have sold of Warner and Cowan's Self-Regulating Gas-Meters up to this date (Feb. 9, 1876)—

2052	2-light.	5	60-light.
2056	3 „	4	80 „
1043	5 „	8	100 „
441	10 „	11	150 „
24	15 „	6	200 „
114	20 „	1	300 „
29	30 „	1	500 „
30	50 „	Total, 5825 meters.	

And, in addition to these 5825 complete meters, we have sold 600 of W. and C.'s patent drums—together, amounting to **£12,914.**

The total increase in our general business, during the year 1875 (over 1874), was **£16,814.** As the sales of W. and C.'s Meters formed so large a part of that amount, our customers will be able to judge of the confidence with which the Self-Regulating Gas-Meter has been received, and which is fully justified by our knowledge of the entire satisfaction which has in every case followed its adoption.

Notwithstanding a considerable purchase (in 1875) of property adjoining our works in Edinburgh, and the erection of three storeys of large additional workshops, the increase of our business during the past season required us to have a considerable number of hands at work during the night, and it was even then impossible to keep pace with the orders entrusted to us. We, therefore, again find it necessary to extend our premises still further in Edinburgh, and are now doing so, and hope soon to be in a position to meet all the requirements of our customers *immediately as they arise.*

Our greatly increasing business with the Metropolitan Gas Companies, and companies in the more southern districts of England, calls for a large extension of our works in London also, and we are at present arranging to have such carried out this spring.

With reference to the Warner and Cowan Meter, we have confined our remarks to its position *in this country*, but, as is well known, it is being very extensively manufactured by Messrs. Faas and Company, of Frankfort and Vienna, whose returns show results equally satisfactory as to the confidence felt in the Meter by foreign gas companies.

The more we know of Warner and Cowan's Patent Self-Regulating Gas-Meter, the greater is our confidence in it, and we are certain that our opinion of it is shared by our customers, whose continued support we most respectfully solicit, assuring them of our best efforts to retain their patronage.

W. & B. COWAN,

ESTABLISHED 1827,

KING HENRY'S WALK,
BALLS POND ROAD,
(NEAR DALSTON JUNCTION STATION.) **LONDON, N.**

BUCCLEUCH ST. WORKS,
EDINBURGH.

N.B.—W. & B. COWAN'S large and increasing Export Trade is provided for by their keeping constantly on hand a very large stock of both Wet and Dry Meters, ready for immediate despatch to the British Colonies and Foreign Countries.

C. & W. WALKER,
8, FINSBURY CIRCUS,
LONDON, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the im-portant results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

They are, in all cases, constructed under guarantees to perfectly perform their work. They are now extensively used in the largest gas-works of London and the chief cities of Europe, the number in use exceeds **one hundred,** and their perfect efficiency and profit to a gas company have been fully established with every variety of coal used in Europe. References can be given to the largest gas-works in Europe.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, re-quiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. AND W. WALKER, 8, FINSBURY CIRCUS, LONDON, E.C., or to Mr. WILLIAM MANN, late Superintendent of the Chartered Gas-Works, BLACKFRIARS, LONDON; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

Now ready, Price 2s. 6d., Revised Edition,

THE TRANSFER OF GAS-WORKS TO LOCAL AUTHORITIES, from 1868 to 1875, with a Review of the LONDON GAS SUPPLY. By ARTHUR SILVERTHORNE, C.E.

CROSBY, LOCKWOOD, AND CO., 7, STATIONERS HALL COURT, LONDON.

Just published, price 10s. 6d.,

REGISTRATION OF DISTRIBUTORY PLANT.

The forms for this purpose are to illustrate the Paper on Distribution of Gas, read at the Edinburgh Meeting of the British Association of Gas Managers. By the use of the synopsis the whole of the out-door plant may at once be seen, with all matters pertaining to the same.

W. J. WARNER, Engineer.

South Shields.

IN THE MATTER OF

BRONNER'S GAS-BURNERS.

HENRY GREENE AND SON, 155, Cannon Street, London, Sole Agents for Great Britain, Ireland, and Colonies, of Brönner's Improvements in Gas Lighting, beg to inform the public that on the 13th of January, 1876, Julius Brönner obtained an injunction in the Court of Session, Scotland, against Donald M'Vean, Gas-Fitter, 14, Newton Street, Glasgow, prohibiting him from in any way advertising or offering for sale as Brönner's Burners, any Burner not manufactured by Julius Brönner, or from in any way inducing the public to believe that the said Donald M'Vean sells or keeps for sale Brönner's Burners, manufactured by Julius Brönner, while such is not the case.

Also that on the 9th of November, 1875, he obtained injunction in the same Court, and in the same terms, against R. M. Brechin and Co., 46, North Hanover Street, Edinburgh.

Also that on the 20th of April, 1875, in a suit in Chancery, before Vice-Chancellor Malins, number 1874, B 365, he obtained injunction against another defendant, in the same terms and on similar grounds.

T. NEWBIGGING,

CONSULTING GAS ENGINEER,

5, NORFOLK STREET, MANCHESTER.

Mr. ALFRED LASS,

60, CORNHILL, LONDON, E.C.,

Is prepared to open the Books, and, if necessary, keep the Accounts of Gas and Water Companies.

To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.

To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

D. M. NELSON,

48, GORDON STREET (late 135, BUCHANAN ST.),

GLASGOW,

Supplies every requisite in connexion with the distribution of Gas and Water.

Estimates and prices on application.

WOOD GRIDS for Purifiers and Scrubbers.

Cast-Iron PIPES and VALVES.

Street LAMP-PILLARS.

Patent Pipe SCREWING-MACHINES, &c.

BAILEY'S Patented Inventions are now in extensive use wherever steam is known. Bailey's Patent Steam Gauges, Pyrometers, Water Gauge Cocks, Test Pumps, Fusible Plugs, Steam and Water Valves, Safety Valves, Junction Valves, Pumps, Tell-Tales, Recorders, Lightning Conductors, Electric Telegraphs, Turret Clocks, Steam Joint Cement, Lifting Jacks, Boiler Feeders, Lime Catcher and Separator, Injectors and Ejectors, and every description of first-class Brass Work for Engines and Boilers. Gas-Works Managers who have not our large book should send for it.

16th edition, 1000 engravings, 4to., post free 2s. in stamps, weight 10 oz., cost of production £1000,

BAILEY'S Illustrated Inventions, containing details and prices of goods in our five several departments:—(1) Brass Foundry, Steam Gauges, Indicators, Feeders, and Fittings; (2) Engineers Sundries, Small Tools, and Stores; (3) Machine Pump and Fire Engine; (4) Turret Clock, &c.; (5) Electric Telegraph, A B C Instruments, Bells, and Apparatus.

J. BAILEY and Co., Albion Works, Salford, LANCASHIRE.

CATHELS'S Patent District Dry Gas-GOVERNOR is the only perfect self-acting contrivance for Reguiating the Pressures in the higher levels of a district.

For prices, &c., apply to the Manufacturers, Messrs. GUEST AND CHRIMES, ROTHERHAM.

CATHELS & TERRACE'S Patent Four-WAY DISC GAS-VALVE is the simplest and best Valve for Purifiers, and as a By-pass for other apparatus in Gas-Works. It is always gas-tight, and has no springs, ground faces, or other delicate parts. By its use the flow of the gas cannot be accidentally stopped, and it never sticks.

For prices, &c., apply to the Manufacturers, Messrs. GUEST AND CHRIMES, Foundry and Brass Works, ROTHERHAM.

CLOTH GAS-BAGS FOR MAINS,

As supplied to the Imperial, Chartered, and other London and Provincial Gas Companies. Bellows and Valves for inflating Well Dresses, Stokers Gloves, India-Rubber Suction and Delivery Hose, Gas-Tubing, Leather, India-Rubber and Gutta-Percha Machine-Bands, Sheet and Washers and Steam Joints.

T. BUGDEN, Manufacturer,

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THE THAMES BANK IRON COMPANY,

(Successors to LYNCH WHITE,)

SUPPLY FROM STOCK

CAST-IRON RETORTS, SOCKET-PIPES for GAS or WATER PURPOSES, FLANGE-PIPES for STEAM, RAIN-WATER PIPES and GUTTERS, HOT-WATER PIPES and BOILERS, and all requisite Connexions for same; also LAMP-COLUMNS, LAMPS, WROUGHT FRAMES, WROUGHT-IRON TUBING, &c., &c.

All kinds of Gas-Works Apparatus and General Castings made to Pattern or Drawing.

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Gas-Meter, Gas Apparatus, and Gas-Fittings Manufacturers,

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STATION-METERS, GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,

And every description of Gas-Fittings and Gas Apparatus.

TO GAS COMPANIES AND THE TRADE.

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MANUFACTURERS OF

CRYSTAL, BRONZED, & ORMOLU CHANDELIERS, IMPROVED CRYSTAL STAR & SUN LIGHTS, VESTIBULE LAMPS, AND THE PATENT CRYSTAL ILLUMINATION.

A LARGE STOCK ALWAYS IN HAND OF

IRON, BRASS, COMPOSITE, AND LEAD TUBES, FOR GAS AND WATER,

AND EVERY DESCRIPTION OF

GAS AND WATER FITTINGS.

THE PATENT DRY AND WET METER, WITH THE LATEST IMPROVEMENTS.

STREET LAMPS AND COLUMNS IN GREAT VARIETY.

WORKS: LONDON AND BIRMINGHAM.

GAS MOONS, Cut and Engraved, of the newest designs

GAS REFLECTORS In Silver and Glass

GAS NIBS AND **BURNERS** Of every description.

Pattern-Books of Gas-Fittings, Crystal and Ormolu Chandeliers for 1876, are now complete.

City Show-Rooms and Manufactory, 147, HOUNDSDITCH, LONDON.

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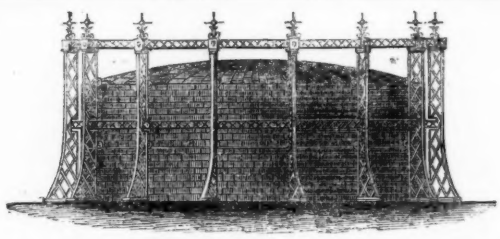

THE HORSELEY COMPANY,

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GAS ENGINEERS, IRONFOUNDERS, &c.,

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GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED, LAMP-POSTS, PIPES,

AND ALL REQUISITES FOR EITHER

GAS OR WATER WORKS;

ALSO

MAKERS OF ROOFS, BRIDGES, &c.

JOHN HALL AND CO., STOURBRIDGE,

Manufacturers of FIRE-BRICKS, LUMPS, TILES,

AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.

N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short Notice.

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GAS ENGINEER AND CONTRACTOR FOR THE ERECTION OF GAS-WORKS, AND FOR THE

SUPPLY OF RETORTS, FIRE-BRICKS, CAST-IRON MAINS,

AND ALL MATERIALS FOR GAS MANUFACTURE AND DISTRIBUTION.

WATER-MAINS.

COTTERILL'S PATENT STEEL TUBE-DRILLS, for connecting services to water-mains, *under pressure*, without turning off the water. They drill and tap themselves, and are left in the mains. Made of all sizes, from ¾ to 2 inches and upwards. They cost less than the ordinary plan.

Apply to CHARLES FORSTER COTTERILL, Cannock, STAFFORD, Patentee.

JAMES OAKES & CO.,

ALFRETON IRON-WORKS, DERBYSHIRE, AND

WENLOCK IRON WHARF, 21 & 22, WHARF ROAD, CITY ROAD, LONDON, N.,

Keep in London and at their works large stocks of PIPES and CONNEXIONS (1½ to 36 inches in diameter); also make and supply Retorts, Tanks, Columns, Girders, Special Castings required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

CHARLES HORSLEY, Agent.

INTERNATIONAL EXHIBITION, 1862.

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For excellence of Fire-Clay Gas Retorts, and "HONOURABLE MENTION" for good quality of Fire-Bricks.

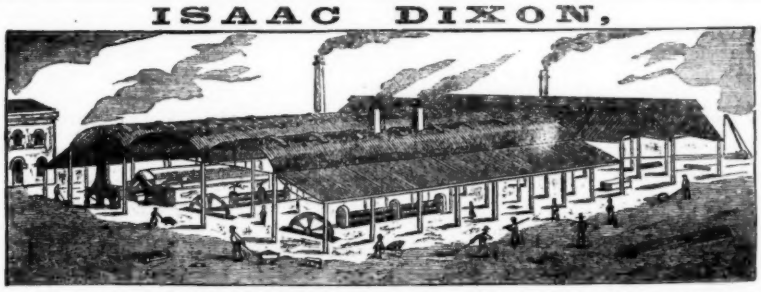
WILLIAM STEPHENSON & SONS,

THROCKLEY,

NEWCASTLE-ON-TYNE.

ISAAC DIXON,

WINDSOR IRON-WORKS, LIVERPOOL.



LONDON OFFICES: 60, QUEEN VICTORIA ST., E.C.

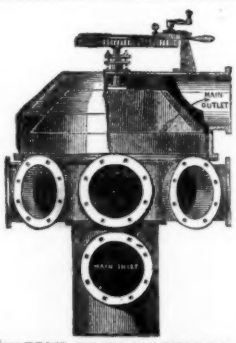
Manufacturer of SELF-SUPPORTING GALVANIZED CORRUGATED, CURVED, and every kind of IRON ROOFING, CHURCHES, SCHOOLS, SHEDS, and IRON BUILDINGS.

WROUGHT and CAST IRON GIRDERS, BRIDGES, TANKS, &c., and all kinds of WIRE WORK, FENCING, GATES, HURDLES, &c., for Home or Abroad.

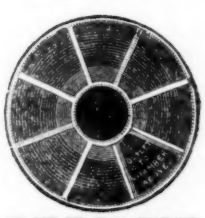
DIXON'S CELEBRATED SELF-SUPPORTING IRON ROOFS are specially suitable for Forges, Rolling-Mills, Iron-Works, Shipbuilding Yards, Mines, Collieries, Gas and Water Works, and for general purposes.

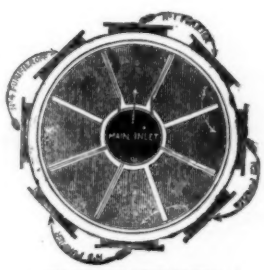
For Roofs with Timber Framing, DIXON'S GALVANIZED OR TARRED IRON SLATES form a durable and cheap covering, costing only about the same, when fixed, as felt and boards.

DRAWINGS, ESTIMATES, AND ILLUSTRATED CATALOGUES MAY BE OBTAINED ON APPLICATION.



C. & W. WALKERS' PATENT CENTRE-VALVES.





ELEVATION OF THE CENTRE-VALVE. PLAN OF THE VALVE. PLAN OF THE BODY.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers on the system of three in action, and one out of action. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A considerable improvement and saving is effected in the cost of the connecting-pipes.

MIDLAND IRON-WORKS. DONNINGTON, near NEWPORT, SHROPSHIRE; 8, FINSBURY CIRCUS. LONDON.

FLETCHER AND MURPHY,

GARRATT STREET WORKS, OLDHAM ROAD, MANCHESTER;

Manufacturers of

IMPROVED CONSUMERS WET GAS-METERS

IN CAST-IRON CASES,

THE UNVARYING WATER-LINE GAS-METER,

AND

IMPROVED DRY GAS-METERS;

STATION-METERS OF ALL SIZES, with PLANED JOINTS;

GOVERNORS, PRESSURE AND EXHAUST REGISTERS, TEST HOLDERS.

And all kinds of Experimental Gas Apparatus.

SZERELMEY Liquid Enamel, for Iron-work exposed to the atmosphere, supersedes paint, dries in two hours, absolutely prevents rust, contains no oil, requires no mixing, is ready for use, is laid on like paint, covers new or old iron or wood, old paint, tar, or whitewash, is waterproof, gives a fine polished surface, and costs scarcely one-fourth as much as paint—namely, one halfpenny per square yard. Samples to any address for 12 stamps. Particulars free on application.

SZERELMEY Iron Paint has stood the test of 24 years experience. The gilding on the Victoria Tower of the Houses of Parliament was laid on over it upwards of 20 years ago, and is still in perfect condition.

SZERELMEY Stone Paint thoroughly waterproofs brick and other walls without giving them the appearance of having been painted.

COPIES of Reports on the Szerelmey compositions, by Sir Charles Barry, Sir R. J. Murchison, and Professor Faraday (printed by order of the House of Commons), with other information, may be had on application.

NONE of the Szerelmey compositions contain white or red lead, arsenic, or any other injurious ingredient. When in use and while drying they have a purifying effect on the atmosphere.

SZERELMEY Liquid Enamel.—The cost of the Enamel when laid on is about one halfpenny per square yard. We are now entering orders for execution at any time before the end of March, at £25 per ton, subject to a liberal discount for cash, particulars of which we will send, if asked. A ton measures about 125 gallons, and is ready for use.

SHIPPERS will receive liberal treat-ment at our hands. They will find that our Enamel Paste can be supplied for shipment at a price with which no ordinary paint can compete.

SZERELMEY Debentures. — Investors desirous of subscribing for the remainder are requested to intimate their intention as early as possible. The debentures will be dated Jan. 1, 1876; from that date interest at 8 per cent. per annum (for which coupons are attached) will be paid quarterly. No prospectus will be advertised, but full particulars will be sent in reply to any application addressed to N. C. SZERELMEY AND COMPANY, Limited, 24, City Bank Chambers, Threadneedle Street, LONDON, E.C.

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OFFICES:
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SOLE PROPRIETORS AND MANUFACTURERS OF
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TORBAY IRON PAINTS.

(ESTABLISHED 1851.)

TRADE MARK

These Paints have been for many years extensively used in Her Majesty's Royal Dockyards, Woolwich Arsenal, the Shorncliffe and Curragh Camps, War Departments, and Colonies, and are largely supplied to Railway, Harbour, and GAS COMPANIES, Shipowners, Engineering Establishments, Railway Carriage and Waggon Works, and the Paint Trade generally. They are the BEST PROTECTORS of IRONWORK, even arresting corrosion after it has set in; and their base being oxide of iron, they are free from those properties which make lead paints so destructive to ironwork. They do not scale or blister, are not affected by great heat, and are the only Paints which will resist the effects of sulphuretted hydrogen. Their DURABILITY and covering properties have borne the test of A QUARTER OF A CENTURY'S PRACTICAL TRIAL.

The undermentioned colours—ground in best linseed oil, and requiring only before use to be thinned down in the ordinary way—are kept in stock:—

Torbay Brown.	Torbay Red.
Dart Green.	Slate.
Dart Yellow.	Buff.
Brixham Black.	Torbay Chocolate.
Light Blue.	Cream Colour.
Dart Brown.	Dart Umber.
Imperial Stone.	Light Stone.
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Carriage Red.	Dark Stone.
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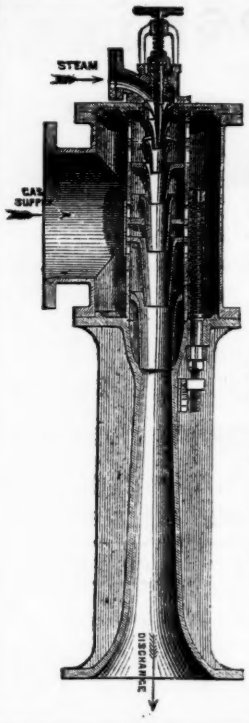
All other Colours made to order.

PRICES and TESTIMONIALS on APPLICATION.



KÖRTING BROTHERS,

SOLE LICENSEES FOR
W. CLELAND'S PATENT STEAM-JET GAS-EXHAUSTER.

E. KÖRTING'S PATENT
STEAM-JET GAS-EXHAUSTER,

Small Cost—Compactness—Perfectly Self-Acting—Self-Regulating—Self-Cleansing—No Steam-Engine—No Attention—No Extra Room Required—No Wear and Tear—No Noise—No Oscillation in Vacuum, or Back Pressure.

UPWARDS OF 150 IN USE IN CONTINENTAL GAS-WORKS.

IN ENGLAND SUPPLIED TO—

Chartered Gas Co., London; London Gaslight Co., London: South Metropolitan Gas Co., London: Phœnix Gas Co., London; Liverpool Gas Co., Linacre; Corporation Gas-Works, Bolton; Cornholme District Gas-Works; Epsom and Ewell Gas Company; Horsham Gas Company; Gaslight Company, Ipswich; Gaslight and Coke Company, Cheltenham.

E. KÖRTING'S PATENT STEAM-JET REVIVIFYING BLOWERS FOR THE PURIFYING MATERIAL.

W. CLELAND'S PATENT STEAM GAS-SCRUBBER,
Combining small cost and thorough efficiency, with absence of any mechanical means and necessity of renewing the scrubbing material.

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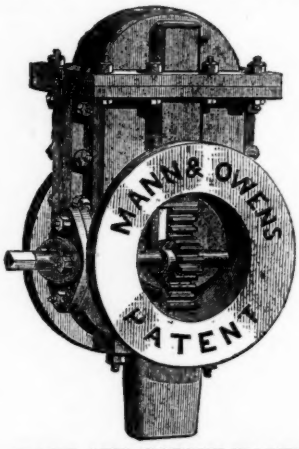
To whom all inquiries for these districts should be addressed.

MANN & OWENS' PATENT GAS-VALVE.



RACK AND PINION VALVE.

SCREW VALVE.

The advantages of this Patent Valve over all others yet introduced are, that it is always as tight as the best wedge or spring valve, without the possibility of setting fast or becoming suddenly leaky. The surfaces not being in contact during the operation of opening or closing, leakage through wear and tear is avoided.

The Gas Engineer will not fail to see the importance of such a valve in connexion with his purifying apparatus, particularly in the case of large sizes.

The slide being operated either by a screw and nut, or by a pinion and rack, a cam bearing upon a plane, cast on the back of the Valve, forces it against the face, and renders the escape of gas an impossibility. By a slight turn of the pinion or screw, the slide is released, and brought away from the face, by which means friction is avoided, and the only force required to open the Valve is that due to its own weight.

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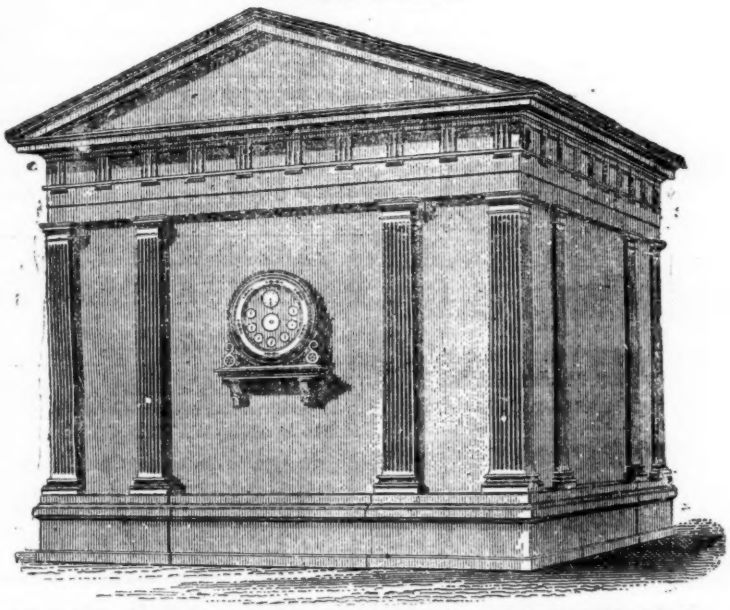
OF THE HIGHEST EXCELLENCE;

ALSO LICENSEES AND MANUFACTURERS OF

WARNER & COWAN'S PATENT SELF-REGULATING GAS-METERS;

ROUND STATION-METERS,

ON CAST-IRON STANDS.



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WITH PLANED JOINTS.

GOVERNORS, GAUGES, INDICATORS, MAIN COCKS, &c.

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Home and Foreign Orders promptly attended to.

All Sizes of CONSUMERS METERS, STATION-METERS, and GOVERNORS generally in Stock.

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TABLE GLASS OF ALL KINDS.

CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.

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MR. ANDERSON advises Companies on all matters connected with the manufacture of Gas and the construction of Works.

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RETORT SETTINGS, heated by tar without the production of smoke.

STEAM-ENGINES and EXHAUSTERS, separately or combined.

FOUR-WAY VALVES, one of which is equal to three ordinary Valves.

STATION GOVERNORS—the Gasholder cannot tilt and cause accident.

BREEZE AND TAR FUEL MACHINE.

A Pamphlet containing Eighteen Illustrations of the foregoing, with letterpress of the construction of Works, post free, 2s. 6d.

N.B.—The second edition of this Work, *now ready*, contains Illustrations of the Machine for converting Breeze and Tar into Fuel for heating the Retorts.

"The Author is well qualified to speak authoritatively upon the important subjects to which his pamphlet refers."—*Artizan.*

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WILLINGTON QUAY,

NEAR NEWCASTLE-UPON-TYNE,

Manufacturer of

CLAY RETORTS, FIRE-BRICKS, AND EVERY DESCRIPTION OF FIRE-CLAY GOODS

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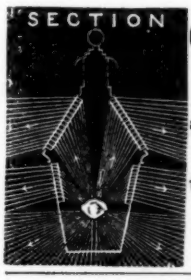

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CATOPTRIC LAMP

Is now in use in Moorgate Street, Cheapside, and Trafalgar Square, and has been in successful operation upon Waterloo Bridge since Oct. 7, 1871.

T. A. SKELTON, 37, Essex St., Strand, LONDON, INVENTOR AND PATENTEE.

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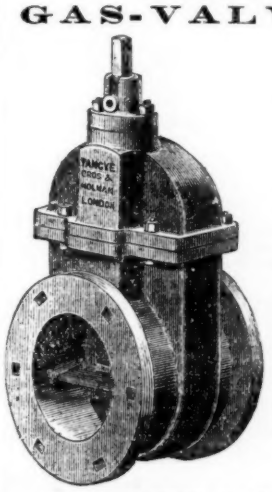

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Inch.	s.	d.
3	25	0
4	36	0
5	40	0
6	54	0
7	63	0
8	80	0
9	85	0
10	100	0
12	120	0
14	140	0

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LAURENCE POUNTNEY LANE,

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CANNEL COAL MERCHANT,
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LOTHIAN'S CANNEL
Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

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Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

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Yields 13,320 cubic feet of 32·5-candle gas per ton.
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Analysis and Price on Application.

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FRAMWELLGATE COAL COMPANY,
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Are prepared to supply their
SCREENED AND NUT GAS COALS.
This Coal yields 11,000 cubic feet of gas and 13½ cwts. of coke per ton.
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ROBERT CRAWFORD & CO.,
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Supply and Contract for all the principal Scotch Cannel Coal (including BOGHEAD, HARTHILL, RIGSIDE, CHAPELSIDE, LESMAHAGOW, and BRAEHEAD), f.o.b., or delivered at home or abroad.
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PREVENTS WASTE OF GAS FROM RETORTS;
SAVES CLAY RETORTS FROM DESTRUCTION BY FIRE;
GREATLY ECONOMIZES THE USE OF FIRE-BRICKS;
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POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.
One ton yields 13½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.
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The Subscriber is prepared to contract for the supply of all the principal SCOTCH CANNEL COALS. Prices and Analyses of the various Coals will be forwarded on application.
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Scotch Churls
PRESENT PRICE:
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Cubic Feet.	Illuminating Power.	Coke (sup. qual.).
10,000 ..	20 candles. ..	12 cwt.

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WOOD PURIFIER SIEVES,
Which have now been used for fifteen years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.
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Our New and Choice Designs for the above, with prices, are forwarded to any part of the world on receipt of twelve stamps. Estimates for work at home or abroad.
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CANNEL COAL.
COPPA COLLIERY, MOLD,
Beg leave to call the attention of Gas Companies to the superior quality of their
CANNEL FOR GAS-MAKING PURPOSES.
This Cannel produces in actual working, in iron retorts, 9200 cubic feet of 32-candle gas, and upwards of 11 cwt. of coke, and in clay retorts will produce 11,500 cubic feet of 25·9-candle gas.
Ports of shipment—Birkenhead or Connah's Quay.
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HEBBURN MAIN GAS COALS.

Cubic feet of Gas yielded per ton . . .	10,050
Illuminating power in sperm candles . .	15·4
Yield of coke per ton of good quality . .	13½ cwts.

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PLUTONIC CEMENT
For Repairing and Jointing Gas-Retorts, and preventing porosity,
Manufactured only by
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And Every Description of Best Fire-Bricks.

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MESSRS. NEWTON, CHAMBERS, & CO.,
THORNCLIFFE IRON-WORKS AND COLLIERIES,
NEAR SHEFFIELD,
STRONGLY RECOMMEND A TRIAL OF THEIR
CELEBRATED SILKSTONE GAS NUTS.

Analysis by F. J. EVANS, Esq., Chartered Gas Company, Horseferry Road, Westminster:—

(COPY.)

	Cubic Feet of Gas per Ton of Coal.	Illuminating Power in Candles.	Coke per Ton of Coal used.	Ash in Coke, per Cent.	Sulphur in Coal, per Cent.
Silkstone Nuts . . .	10·800	15·85	12·66 cwt.....	6·0	0·69

NOTE.—The illuminating power of the gas was tested by the standard burner now used in London by the Gas Referees, under the City of London Gas Act, 1868.

Horseferry Road, Westminster, March, 1870. (Signed) F. J. EVANS.

These Nuts are extensively used by various Gas Companies throughout the Kingdom, who bear strong testimony to their value.

APPLICATIONS FOR PRICES, &c., TO BE SENT DIRECT TO THE COLLIERY, AS ABOVE.

GAS PURIFICATION & CHEMICAL Co., LIMITED,

(Successors to JOHN WILLIAM O'NEILL & CO.,)

Offices—PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.,

CONTRACTORS FOR GAS PURIFICATION BY OXIDE OF IRON.

The superiority of the material supplied by this Company is generally recognized, and it is now in use in nearly all the London and most of the large Provincial Gas-Works.

JOHN WILLIAM O'NEILL, SAMUEL H. JOHNSON, } Joint Managing Directors.

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THE DERBYSHIRE

SILKSTONE COAL COMPANY, LIMITED,

CAN OFFER A

GAS COAL

Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	**10,775**
Weight of coke in lbs. per ton of coal	**1,465**

ANALYSIS AND PRICES ON APPLICATION TO

Mr. EDMUND TAYLOR, Secretary,

ALBERT COLLIERY, NEWBOLD, NEAR CHESTERFIELD.

THE LOCHORE AND CAPLEDRAE CANNEL COAL COMPANY, LIMITED.

Works: LOCHORE by LOCHGELLY, FIFESHIRE. Office: CUSTOM HOUSE CHAMBERS, LEITH.

This Company request attention to the very superior quality of their Cannel Coals.

1. The following are the practical results given by Dr. Wallace, of Glasgow, of analyses of their Lochore and Capledrae Cannels:—

	Sample worked at Capledrae.	Sample worked at Lochore
Gas per ton of coal, at 60° Fahr. and 30 inches barometric pressure . .	13,095 cubic feet.	11,760 cubic feet.
Illuminating power, in standard sperm candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	32·91	34·83
Value of 1 cubic foot of gas in grains of sperm	780	836
Equivalent of a ton of coal in pounds of sperm candles	1,459	1,404
Durability of 1 cubic foot by 5-inch flame	69 minutes.	71 minutes.
Gravity of the gas (air = 1000)	596	594

Remarks.—This (the sample from Capledrae) is a Cannel Coal of first-class quality, giving 13,000 feet of 33-candle gas. It contains only a minute proportion of sulphur, and the ash is almost quite white. The coke is of rather inferior quality.

Remarks on Sample from Lochore.—This is a Cannel Coal of first-class quality, giving a large yield of very rich gas and a coke of medium quality.

2. The following are the practical results of analyses by Dr. Wallace of the Company's Waverley Cannels:—

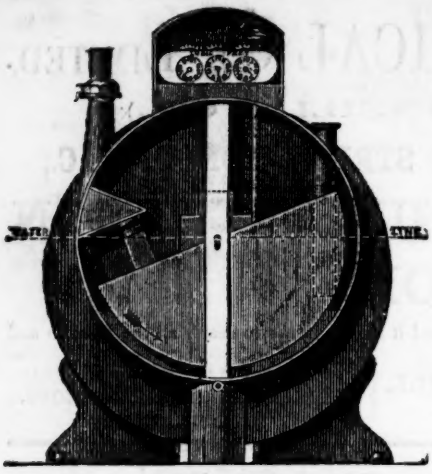
	Capledrae Waverley.	Lochore Waverley.
Gas per ton of coal, at 60° Fahr. and 30 inches barometer	9,120 cubic feet.	11,145 cubic feet.
Illuminating power, in standard candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	36·62	33·09
Value of 1 cubic foot of gas in grains of sperm	878	794
Equivalent of a ton of coal in pounds of sperm candles	1,145	1,264
Durability of 1 cubic foot of gas by 5-inch flame	80 minutes.	67 minutes.
Gravity of the gas (air = 1000)	677	597

Remarks on the Sample of Capledrae Waverley.—This Coal gives fully 9000 feet of gas of 36½ candles, and is admirably adapted for bringing up the quality of gas made from common coal or inferior qualities of cannel. The tests were made at a rather high temperature, this being one of the coals that stand a very high heat without serious diminution of the illuminating power of the gas The coke contains 60 per cent. of ash, and is therefore almost valueless, but the proportion of sulphur is very moderate.

Remarks on the Lochore Waverley.—This is a first-class Cannel Coal, giving 11,000 cubic feet of 33-candle gas. The quantity of sulphur is very minute, and the ash is nearly white. The coke is of inferior quality, but not wholly valueless.

Applications for full Copies of Analyses and Prices may be made to the Company.

OFFICE: CUSTOM HOUSE CHAMBERS, LEITH.



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UNVARYING WATER-LINE GAS-METER.

(SANDERS AND DONOVAN'S PATENT.)

"Unquestionably the best Water Gas-Meter now in use."—THOS. G. BARLOW, C.E.

Over 90,000 in action.

MANUFACTURERS

THE GAS-METER COMPANY,

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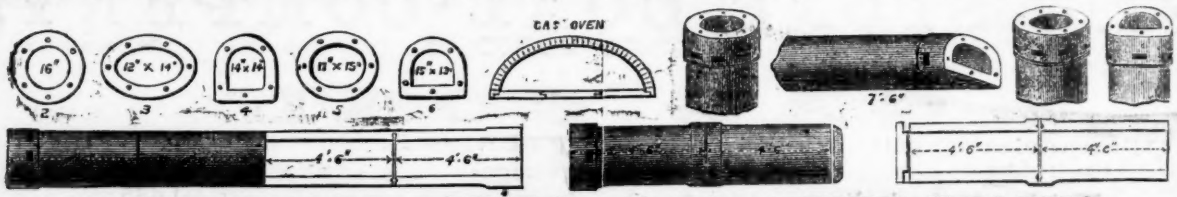

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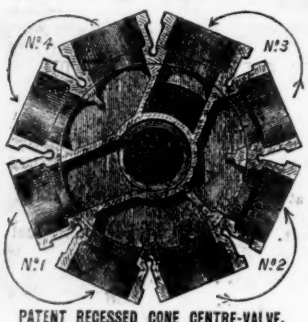
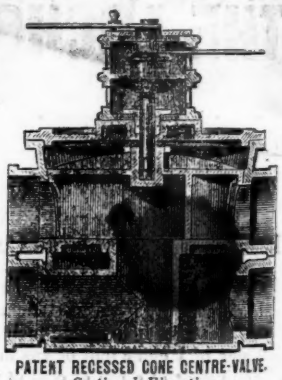
Constructed on the principle of the ordinary Plug-Cock.

THROUGH-WAY & FOUR-WAY COCKS

Of all descriptions.



PATENT RECESSED CONE CENTRE-VALVE.
Sectional Plan.



PATENT RECESSED CONE CENTRE-VALVE.
Sectional Elevation.

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D. HULETT and CO., 55 and 56, HIGH HOLBORN, LONDON,

PATENTEES and MANUFACTURERS of the ONLY GOOD MERCURIAL GAS REGULATOR

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